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International Family Planning Perspectives

A Fertility Puzzle in Sri Lanka

Contraceptive Prevalence in Niger
Islam, Procreation and the Law
Reproductive Intent and Fertility Rates

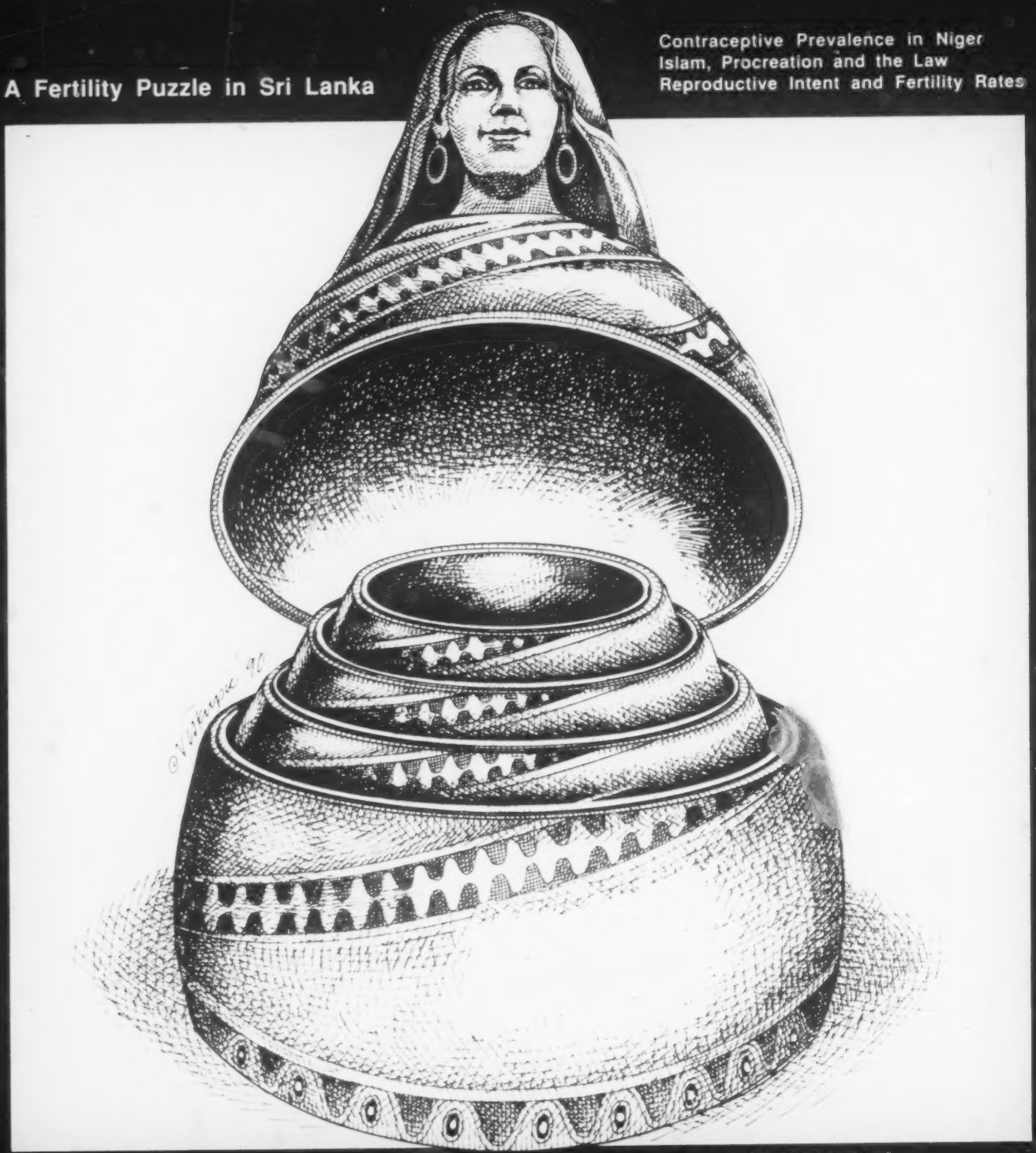

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Table of Contents

		Page
Update		82
Articles		
Reproductive Intentions And Fertility Rates	Charles F. Westoff	84
Results of a Contraceptive Prevalence Survey in Niamey, Niger	Maria J. Wawer, Lynne Gaffikin, Voahangi Ravao, Halima Maidouka and Kadi Traoré	90
Fertility and Its Control: The Puzzle Of Sri Lanka	Indra Gajanayake and John Caldwell	97
The Relationship Between Fertility And Contraceptive Prevalence In Zimbabwe	Donald J. Adamchak and Michael T. Mbizvo	103
Comment		
Islam, Procreation and the Law	Zulie Sachedina	107
Digest		
Few in Burkina Faso Use Contraceptives, but Many Would Consider Doing So		112
Tunisian Fertility Fell, Age at Marriage Increased in the 1980s		113
Children Under Age Five Account for Almost Half of All Mortality in Bolivia		115
Many Births in Egypt Are Unwanted, Despite Wide Use of Modern Methods		116
Women in Singapore Find New Hormonal Implants Preferable to Injectables		118
Letters from Readers		119
Note to Authors		121

UPDATE

Vasectomy Without a Scalpel

A new technique for performing vasectomy without a scalpel proved to be faster and produced fewer complications than standard vasectomy when the two techniques were compared during the annual King's birthday vasectomy festival in Thailand.[1] In the no-scalpel technique, the skin of the scrotum is punctured with a dissecting clamp, the puncture is delicately widened and each vas deferens is ligated through the puncture; thus, the technique involves a much smaller incision than the standard vasectomy technique. On the King's birthday in December 1987, 1,203 vasectomies were performed by 28 physicians as part of the proceedings. In 43 percent of the procedures, physicians used the standard method of vasectomy and in 57 percent physicians used the no-scalpel method. The 16 physicians using the standard method averaged 33 vasectomies each that day, while the 12 who used the no-scalpel method completed an average of 57 operations. Nineteen men reported some sort of complication over the next 12 days; 16 of them had had a standard vasectomy (a complication rate of 3.1 per 100 procedures) and just three had had a no-scalpel vasectomy (0.4 per 100).

1. A. Nirapathpongporn, D. H. Huber and J. N. Krieger, "No-Scalpel Vasectomy at the King's Birthday Vasectomy Festival," *Lancet*, I:894, 1990.

Small Thai Families Are Better Off

In rural areas of Thailand, families with 1–2 children appear to have more savings and more modern consumer goods and their children achieve more years of education than is the case with families with four or more children, according to the results of several recent analyses.[1] A comparison of 306 families with 1–2 children and 306 families with four or more children revealed that after family background characteristics had been controlled for as closely as possible, children in the smaller families were more likely to have attained some secondary education (38 percent) than were those from families with four children (31 percent) or with five or more (25 percent). Furthermore, among couples whose land and assets were comparable when they began childbearing, those who had had a small family were more likely than those with a large family to have saved $200 or more (30 percent vs. 20 percent) and were less likely to have no savings (40 percent vs. 60 percent). In addition, even after potentially confounding factors were controlled for, small families were consistently more likely than large families to own a television set, a refrigerator and an electric or gas stove.

1. "Family Size and Well-Being: Evidence from Thailand," *Asia-Pacific Population and Policy*, No. 12, Mar. 1990.

Reducing Mortality in Bangladesh

A community-based maternal and child health and family planning program conducted in Matlab, Bangladesh, since the mid-1970s appears to have reduced child mortality by about one-third and to have produced smaller but statistically significant decreases in neonatal and maternal mortality.[1] Women living in half of Matlab were regularly visited at home by community health workers, who provided family planning services, trained women in the use of oral rehydration therapy, provided immunization services, distributed nutritional supplements for pregnant women and young children, trained traditional birth attendants, offered nutritional advice, treated minor illnesses and referred people who were severely ill to a local clinic. During 1986 and 1987, the mortality rate among children 6–35 months of age was 17.2 deaths per 1,000, 32 percent lower than the rate among comparable children in the half of Matlab not participating in the project. Mortality was especially reduced for respiratory infections (by 53 percent) and diarrheal diseases (by 35 percent). In addition, newborns in the study area were 17 percent less likely to die than were newborns in the comparison area, almost entirely because mortality from neonatal tetanus was 79 percent lower in the study area. Finally, the maternal mortality rate was marginally lower in the study area, mostly because of the significantly lower rates of death from general obstetric causes (42 percent lower) and from the effects of abortion (62 percent lower). The investigators conclude that a few preventive components of the program—measles and tetanus immunization and family planning services—were effective in reducing mortality, but that increasing the availability of curative services would help cut mortality even more.

1. V. Fauveau et al., "The Effect of Maternal and Child Health and Family Planning Services on Mortality: Is Prevention Enough?" *British Medical Journal*, 301:103, 1990.

Uganda's AIDS Problem

The prevalence of human immunodeficiency virus (HIV) infection in Uganda has reached such a high level, according to a recent review article, that designation of risk groups is largely irrelevant.[1] A national serologic survey conducted in 1988 found that rates of seropositivity for HIV infection ranged from seven percent to 12 percent in rural areas and from eight percent to 30 percent in urban areas. At such high levels of seroprevalence, the article's author notes, members of all societal groups are at risk. Cases of tuberculosis, which is closely associated with AIDS in Africa, have proliferated in Uganda recently, with approximately 30 percent of patients admitted to Kampala's main hospital now diagnosed as having the disease.

In addition, the incidence of cerebral malaria has increased among HIV-positive men and women from areas where malaria is endemic, even though such people usually are at low risk of serious malarial complications because of their acquired immunity. Because of cultural taboos, many Ugandan health workers are hesitant to tell patients of a positive HIV test or an AIDS diagnosis; furthermore, the patients generally do not want to hear their diagnosis. Thus, in Uganda, such Western concepts as informed consent and pretest and posttest counseling are problematic. Moreover, simple drugs that could be used to treat the many manifestations of AIDS are largely unavailable. The reviewer concludes that if African AIDS patients are to be treated compassionately and effectively, "huge infusions of education, money and personnel will be needed."

1. R. W. Goodgame, "AIDS in Uganda—Clinical and Social Features," *New England Journal of Medicine*, **323**:383, 1990.

Copper T's Lifespan Grows

Although the suggested effective life of copper IUDs generally ranges from three to six years, a series of long-term multicenter studies conducted by the World Health Organization (WHO) suggests that such IUDs provide contraceptive protection for even longer.[1] Since 1979, the WHO has organized several randomized comparative trials of IUDs such as the TCu 220C, the TCu 380A, the Multiload 250 and the Nova T at centers in 15 countries around the world, involving more than 8,000 women. The three-year pregnancy rate among users of the TCu 380A (1.0 percent) was only slightly lower than the five-year rate (1.4 percent) and the seven-year rate (1.6 percent). Comparable pregnancy rates among users of the TCu 220C were 3.4 percent, 4.0 percent and 4.9 percent, respectively. When data from a center in China where IUD users had relatively high failure rates were excluded, the seven-year failure rate for users of the TCu 380A was 1.0 percent, while the rate for users of the TCu 220C was 3.6 percent. The WHO plans to extend the study to examine even longer term IUD use. The investigators note that for developing-country providers, there are "advantages in not having to replace copper-bearing IUDs among women who have had no medical reason for removal of the device at the currently recommended or regulatory-authority approved times of three to six years"; among them is reducing the risk of pelvic inflammatory disease (which is at its highest shortly after insertion) and of uterine perforation. "The extremely low pregnancy rates found with the TCu 380A, even after prolonged use," the researchers conclude, "should permit . . . consideration [of the TCu 380A] as a very long-term or even permanent method of fertility regulation and . . . as a nonsurgical alternative to tubal ligation."

1. Task Force on the Safety and Efficacy of Fertility-Regulating Methods, WHO Special Programme of Research, Development and Research Training in Human Reproduction, "The TCu380A, TCu220C, Multiload 250 and Nova T IUDs at 3, 5 and 7 Years of Use—Results from Three Randomized Multicentre Trials," *Contraception*, **42**:141, 1990.

AIDS Is Leading Killer in Abidjan

More than one-third of all adults who die in Abidjan, the capital of Côte d'Ivoire, are infected with the human immunodeficiency virus (HIV), according to a study of cadavers conducted in 1988 and 1989.[1] Over a pair of two-month periods, all adult cadavers received by the morgues of Abidjan's two largest hospitals were studied for HIV infection. Overall, 41 percent of males and 32 percent of females had been HIV-positive at the time of death, and 15–16 percent of deaths had been attributed to AIDS. Rates of HIV seropositivity were highest among 30–39-year-olds (53 percent of males and 40 percent of females). Among men, AIDS has become the leading cause of death (15 percent of all deaths), exceeding unintentional injury (14 percent) and tuberculosis (11 percent). Among women, the percentage of annual deaths caused by AIDS (13 percent) is surpassed only by maternal mortality (15 percent) and is followed by cancer (10 percent). The researchers note that "28 percent of all adult female deaths . . . were due to AIDS, pregnancy-related conditions or induced abortions, illustrating how reproductive health dominates the lives and deaths of women in this city."

1. K. M. DeCock et al., "AIDS—The Leading Cause of Adult Death in the West African City of Abidjan, Ivory Coast," *Science*, **249**:793, 1990.

China Is Vast but Not Yet Uniform

Levels of fertility, contraceptive use and socioeconomic development vary substantially among China's 28 provinces, according to a detailed analysis of data from the 1982 census.[1] For example, the total fertility rate ranges from 1.3 lifetime births per woman in Shanghai to almost 4.4 births per woman in Guizhou and averages 2.6 births per woman for the country as a whole. Detailed multivariate analyses reveal that both contraceptive use and socioeconomic development were closely related to fertility decline in the provinces. This suggests, the investigators conclude, that family planning efforts alone were not wholly responsible for the overall fertility decline that has occurred in China, and that greater attention must be paid to improving socioeconomic conditions in less-developed Chinese provinces if the wide fertility differentials are to be reduced. Furthermore, they point out that if other developing countries are to "solve [their] demographic problems, it is imperative to reform and improve their respective socioeconomic structures, rather than simply rely on family planning programs designed by their respective governments."

1. G. Baochang, "On the Effects of Socioeconomic Development and Family Planning on the Decline of Fertility in China," *Chinese Journal of Population*, **1**:125, 1989.

Training Is Vital for FP Providers

Family planning counselors in Ghana who had received special training at five-day workshops were just as likely as untrained counselors to treat younger women and unmarried women disrespectfully, although the former group did provide their clients with more complete information about contraceptive methods than the latter women.[1] Investigators selected 18 women from large towns in the Ashanti area of Ghana and asked them to visit several local clinics seeking family planning services, carefully observe what went on at the clinic and report to the investigators afterwards. These "mystery clients" made 36 clinic visits in all—one each to a clinic with a trained counselor and to a clinic with an untrained counselor. In general, trained counselors presented information on a wider variety of family planning methods and offered more information about individual methods, while untrained counselors sometimes made the client's decision for her rather than allowing her to choose a method herself. However, the older clients generally reported that the counselors were friendly, while the younger (often unmarried) clients said that counselors, whether or not they were trained, were often harsh and dismissive. As a result, local training sessions were subsequently modified to emphasize more strongly the importance of providing value-neutral family planning services.

1. D. Huntington, C. Lettenmaier and I. Obeng-Quaidoo, "User's Perspective of Counseling Training in Ghana: The 'Mystery Client' Trial," *Studies in Family Planning*, **21**:171, 1990.

Reproductive Intentions and Fertility Rates

An examination of data from 134 surveys in 84 countries shows the total fertility rate and the percentage of women who want no more children to be strongly and inversely associated, both in general and among developing nations.

By Charles F. Westoff

Summary

An evaluation of whether the stated desire to terminate childbearing is a valid predictor of fertility, using national data from 134 surveys conducted over the past 10–15 years, reveals a strong relationship between the total fertility rate and the percentage of women who want no more children, even when the comparison is restricted to developing countries only. More than two-thirds of this strong association acts through contraceptive prevalence. Further analyses confirm the relationship between intention and fertility across time for those countries for which there were two sources of data about five years apart (on average). The conclusion reached is that the proportion of women reporting that they want no more children has high predictive validity and is therefore a useful tool for short-term fertility forecasting.

Introduction

In a recent article critical of what he perceives as the unfortunate directions of current population research, Paul Demeny echoed earlier skepticism about the validity of measures of reproductive preferences. Using a finding from the World Fertility Survey (WFS)—that only 8.2 percent of Nigerian women with six children did not want additional children—to illustrate his point, Demeny concluded that "it is obvious that an appropriate change in the way in which the question was asked, or a different set of instructions to the survey takers, could have produced a drastically different figure—say, 30 percent or 55 percent."[1]

Charles F. Westoff is professor of sociology and demographic studies and director of the Office of Population Research at Princeton University. The author would like to thank German Rodriguez, who offered many helpful suggestions at various stages of the analysis; in addition, Noreen Goldman, Lorenzo Moreno, John Bongaarts and, especially, Norman Ryder provided careful readings of the manuscript.

Two decades before, Philip Hauser had launched a similar attack on the reliability and validity of the kinds of data typically collected in Knowledge, Attitudes and Practices (KAP) surveys, the usefulness of which had been espoused by both Bernard Berelson and W. Parker Mauldin.[2] For example, questions on ideal family size prompted Hauser's observation that it "is quite possible that many of the responses in KAP surveys are efforts at politeness to meaningless queries or forced responses to questions to which the respondent really has no answer either before or after the question is put."[3]

As was noted in a recent article, "the measurement of reproductive motivation has long been one of the more controversial areas in demography."[4] Despite recurrent criticisms of the "softness" and questionable utility of attitudinal measures, questions on reproductive intentions, ideal family size, the "wantedness" of past births, intention to practice contraception, and similar topics continue to be included in these surveys.[5]

Twenty-five years have passed since the controversy began; during this period, several hundred new fertility and contraceptive prevalence surveys have been conducted throughout the world, and some limited methodological explorations have been made of the validity and reliability of the key measures included. It seems appropriate to reexamine the question of the validity of measures of reproductive motivation—in this instance, the desire to limit fertility, which is the most commonly used index of the potential market for birth control. Can one take seriously the estimates of the proportions of women who say they want no more children? Or, as Demeny evidently believes, are such estimates so sensitive to slight changes in wording as to be worthless in predicting reproductive behavior?

Other than analyses of the internal consistency of expected associations with age and parity, the methodological work undertaken to answer this question has concentrated largely on whether individual women can, in effect, accurately predict their own future reproductive performance. The general picture that has emerged from several longitudinal studies is that correlations between reproductive preferences and actual fertility at some later time are statistically significant but small in magnitude.[6] That these observed correlations among individual women are higher than those between any other social or economic characteristic and a woman's subsequent fertility is not considered sufficient consolation, considering that some 80–90 percent of the variance remains unaccounted for.

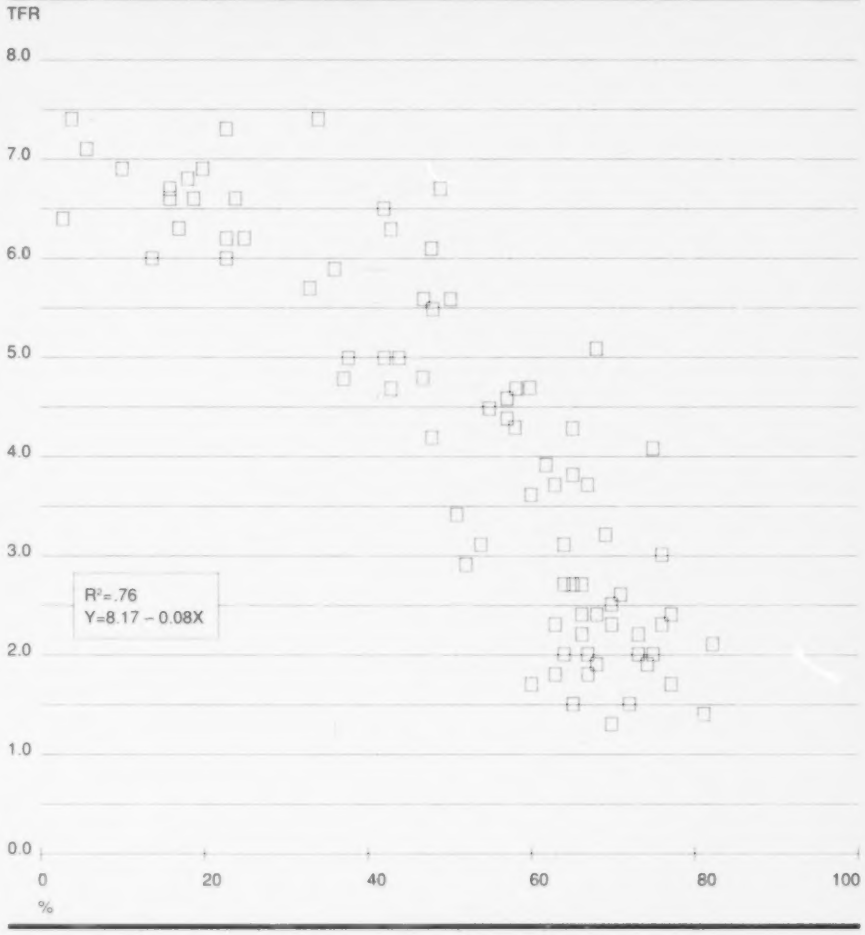
In the aggregate, however, a strong correspondence has been observed between average intentions or family-size preferences and average fertility or the proportions bearing a child over a shorter time period[7] and proportions accepting family planning.[8] Nonetheless, the strikingly high aggregate correspondence seen in these studies typically has been attributed to compensating error (offsetting results of changes in intentions, infecundity and contraceptive failures).

It seems clear, though, that *demographic* interests are best served by aggregate measures and their relationships; the appropriate level of analysis is whether populations on average behave as these populations on average say they are going to behave, not whether individuals' subsequent behavior is consistent with their reported intention.* This point of view results from the argument that in every

*Some association at the individual level is of course required, to lend confidence to consistency at the aggregate level and to the inference of direct and indirect causal connections. One cannot rely solely on compensating error.

population there is a norm concerning fertility defining a central tendency; around this norm is some variation, which stems both from the existence of subcultural norms (e.g., among different ethnic, class, regional or religious subgroups) and from variations in the degree of deviation from norms that is considered acceptable. Also, differences in fecundability, attitudinal stability and contraceptive efficacy act as "noise" in the system of individual statistical accountability, but they are, on average, dampened out in large populations.

Figure 1. Relationship between total fertility rate (TFR) and percentage of married women who want no more children, 84 countries



Methodology

This article evaluates, at the population level, how well the desire to terminate childbearing relates to fertility. Data (mostly national in scope) have been assembled from 134 surveys conducted in 84 different populations over the past 10–15 years. The main sources of these survey data are the WFS, Contraceptive Prevalence Surveys, the Demographic and Health Surveys (DHS) and various surveys conducted by the U.S. Centers for Disease Control.

That the level of aggregation is national is not ideal, since there are enormous variations nationally in population size and (perhaps more important) in internal diversity. Although disaggregation by ethnic or regional identity, by education or by other characteristics might be preferable (and is feasible), the national-level data will suffice for the present. Indeed, it would be interesting to see how the relationships described in this article, which are based on national populations, would change if the units of observation were regions, urban-rural areas or even separate educational categories.

Estimates of the proportion of women who want no more births and of the total fertility rate (TFR) have many problems. One is that different surveys have used different forms of the basic question on reproductive intentions;* another is that there are no measures of the certainty or intensity of such attitudes. Among other problems are that sample sizes vary, resulting in different magnitudes of sampling error, and that survey organizations and their field staff vary in quality. In short, all of these limitations are potential sources of the statistical noise that critics believe is responsible for meaningless answers. Moreover, in some surveys, married women aged 15–49 are questioned, while other surveys are restricted to married women aged 15–44. In many, such as in the WFS, the denominator for reproductive intentions is restricted to fecund, non-pregnant women because women who reported themselves as infecund were not asked the question.

Another problem is the intercountry comparability of the proportion of women who intend to have no more births, which is affected both by the age and parity distributions of the populations and by the factors that determine age at childbearing, such as age at marriage, age at first birth and length of birth intervals. Variations in these parameters influence not only the proportion saying they want no more births but the contraceptive prevalence rate, the TFR itself and the interrelationships between these measures.

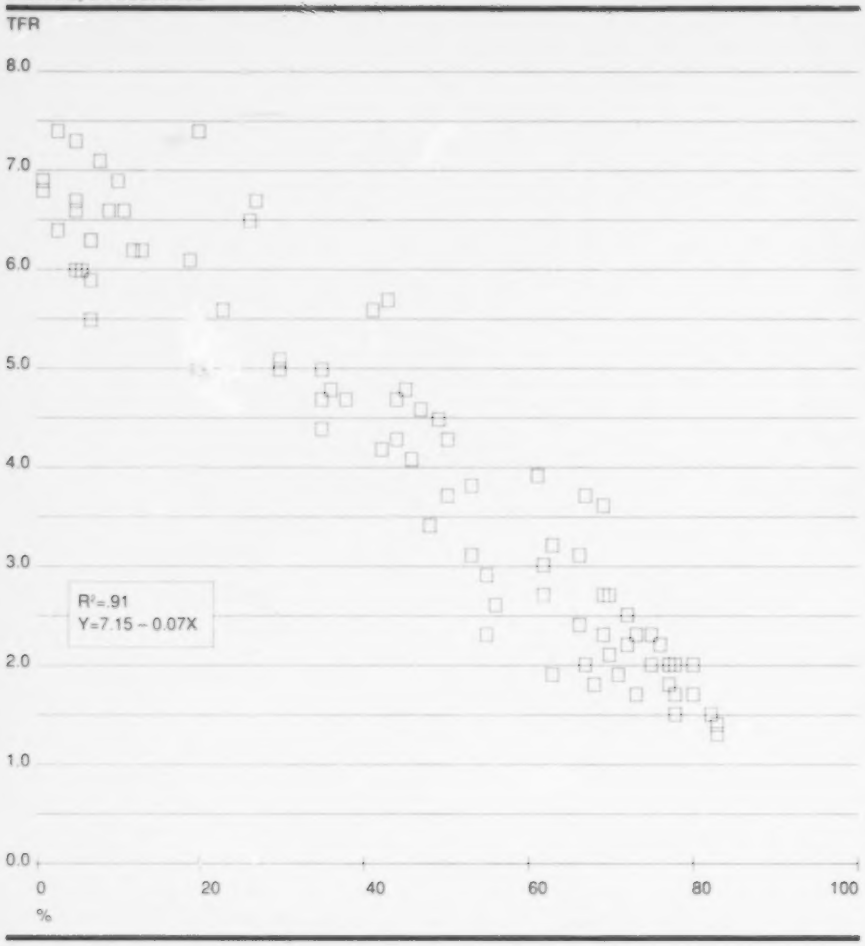
Ostensibly, the TFR is afflicted with fewer measurement problems than are reproductive intentions or contraceptive practice. However, estimates of TFRs vary by source, the main sources being the United Nations and the U.S. Bureau of the Census (and the government sources on which they depend) and the surveys themselves (which are the preferred sources, and the main source of fertility data used in this article). Again, the accuracy of these sources varies, as does the base for their estimates: Some are based on women aged 15–49, and others on women 15–44; some are based on single-year estimates, while others are measured over two-year or five-year periods before the survey. In addition, dates of birth are reported more reliably in some countries than in others. All of these factors introduce further noise into the association between the two variables.

Results

In view of these problems, it is remarkable that when the TFR is related to the percentage of women who want no more children in 84 populations (see Figure 1), there is such a strong inverse association be-

*The three major fertility surveys used the following questions: "Do you want to have children in the future?" (Contraceptive Prevalence Survey); "Do you want to have another child sometime?" (WFS); "Would you like to have another child or would you prefer not to have any more children?" (DHS).

Figure 2. Relationship between TFR and percentage of married women using a contraceptive method, 84 countries



tween them (an R^2 of .76). Furthermore, the result for developing countries alone (68 of the 84 countries shown in Figure 1) is the same. (When the apparent slight curvilinearity suggested in Figure 1 is tested by squaring the TFR, the association with reproductive intentions increases to .80.)

How should this general association be interpreted? Is it likely that, rather than fertility responding to reproductive intentions, the reverse is true—that stated intentions are just a rationalization of behavior? Or can we conclude that the high degree of association provides evidence of the validity of reported desires to terminate childbearing?

If we think about the actual process that presumably connects these variables, a simple and appealing model is the one in which women who want to terminate fertility practice contraception to achieve that goal. Earlier studies have found a very high correlation between fertility and the contraceptive prevalence rate. The most recent analysis, conducted by W. Parker Mauldin and Sheldon J. Segal for 86 countries, produced an R^2 of .87,[9] which is remarkably high, considering the role played by other, noncontraceptive variables, such as age at marriage, breastfeeding and other determinants of fertility, including contraceptive efficacy. Moreover, many of the same data quality problems described above pertain here, including the restriction of the prevalence measure to currently married women and the time lag between the measurement of current fertility and contraceptive practice.

The Mauldin-Segal analysis is replicated in Figure 2, with updated data for some countries; the result is essentially the same as the association they reported (R^2=.91). Obviously, there must be a strong relationship between measures of reproductive intention and contraceptive prevalence. This is demonstrated in Figure 3, which shows that 78 percent of the variance in contraceptive prevalence is held in common with reproductive intention. This finding is another direct validation of information on intentions.

It would be misleading to argue that the practice of contraception determines reproductive preference rather than the more obvious interpretation that populations in which high proportions of women want no more children are likely to have large proportions of couples practicing fertility control. This is not to deny the likelihood that both phenomena occur more or less simultaneously—namely, that the emergence both of an interest in restricting fertility and of contraceptive practice to implement this motive is part of a complex of social change in which the two factors interact and reinforce each other. Nor is it to deny the possibility that supply can generate demand, that the availability of and knowledge about contraceptives can influence the adoption of contraceptive use or that fertility regulation may increase more rapidly than reported intentions to terminate fertility* (i.e., that changes in behavior may occur more rapidly than changes in the norms about behavior).† The argument is simply that the process is primarily demand-driven: The practice of contraception is largely the result of an interest in controlling fertility.

Aside from considerations of data quality, that part of the variance not held in common between the intention to terminate fertility and contraceptive practice is probably attributable mainly to a combination of the unmet need for family planning (women exposed to the risk of an unwanted birth who are not practicing contraception) and of the practice of contraception for purposes of spacing births. The "unmet need" aspect can be inferred from some of the outlying countries in Figure 3 (although these particular cases

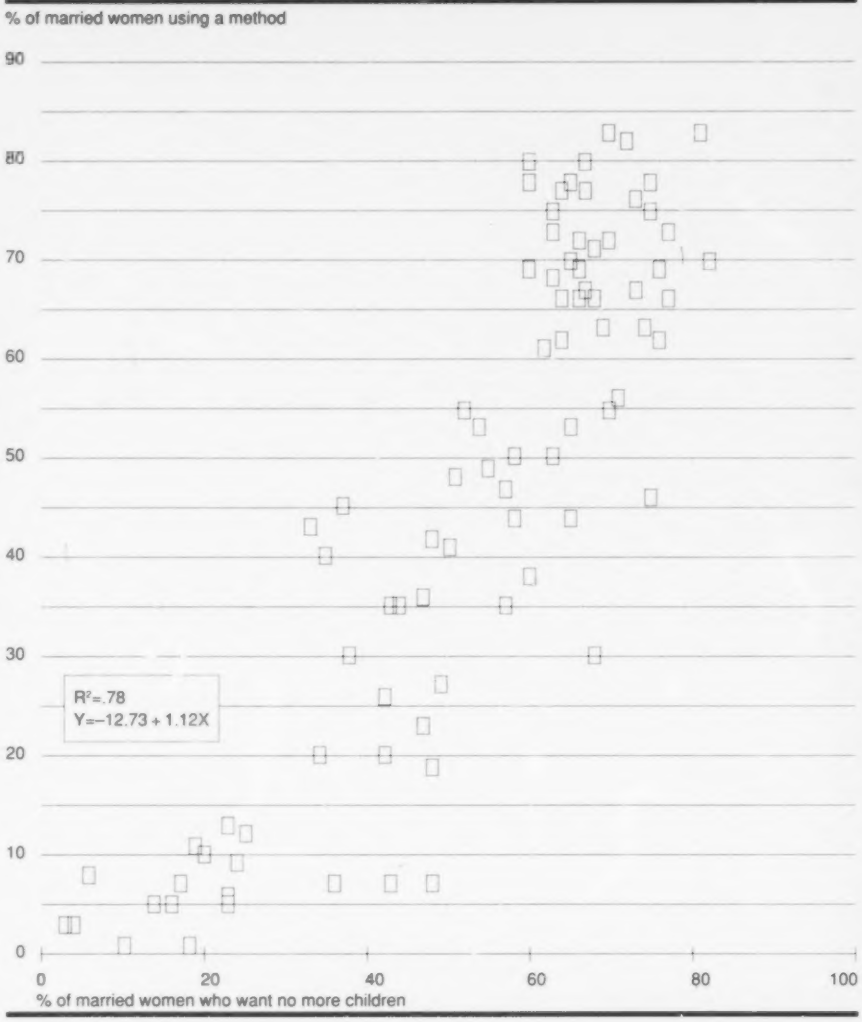
*Some evidence for this is presented by R. E. Lightbourne in "Quality of the WFS Fertility Preference Data," a background paper presented at "World Fertility Symposium: 1971/2–1984," London, April 1984. For a methodological discussion of some of these issues, see also R. E. Lightbourne, "Reproductive Preferences and Behaviour," in J. Cleland and C. Scott, *The World Fertility Survey: An Assessment*, Oxford University Press, 1987, pp. 838–861.

†In the United States, such a phenomenon can be clearly detected in attitudes toward childlessness and the proportions remaining childless. As recorded by the Current Population Survey series, the intention to remain childless has increased only slightly, while childlessness itself is increasing rapidly. Apparently, American women continue to believe that they will have children eventually, but have increasingly postponed childbearing to the point where, for one reason or another, the event never occurs. A similar picture can be seen in connection with the one-child family: The norm of the two-child family is still quite strong, so that remaining childless or having only one child is far out in front of any normative change.

cannot be identified in the figure): For example, in Bangladesh, Pakistan, Nepal and, to a lesser extent, Egypt and Kenya, the percentage of women who want no more children "predicts" a contraceptive prevalence rate considerably higher than the survey result. Similar discrepancies occur in Bolivia, Peru and Haiti—and in some European countries as well, probably for similar reasons (along with extensive use of abortion).

One statistical check on the possibility that fertility determines preferences is to control for parity and then estimate the relationship between intention and fertility. Circularity is of some concern here, since intention is affected by parity and parity, in turn, is another measure of fertility. There are various ways to evaluate this; the simple procedure adopted here is to examine the relationship for a fixed level of actual fertility—women with exactly two births (counting a current pregnancy as a birth). The results for a subset of 61 countries with the appropriate data are interesting: The proportion of the variance in fertility (90 percent) and in contraceptive prevalence (86 percent) explained by the reproductive intentions of women with two children is even higher than the proportion of the variance explained among women of all parities. This result strengthens the interpretation that the measure of reproductive intentions is a valid predictor of fertility.

Figure 3. Relationship between percentage of married women using a contraceptive method and percentage who want no more children, 85 countries



Intentions and Change in Fertility

The conclusions derived from the preceding cross-sectional analyses would be further corroborated if it were possible to demonstrate that a relationship between intentions and fertility exists across time. However, the data are considerably less than ideal for this purpose. One approach is to estimate the relationship between reproductive intentions and fertility as measured a few years later for those countries in which at least two surveys were conducted, or for those countries with only one survey but for which fertility rates at a later date can be derived from other sources. The interval of time between the two measurements varies around an average of five years.* The result (Figure 4—page 88) is an R^2 of .71, only slightly lower than that for the cross-section in Figure 1. Yet another refinement is to examine the association between subsequent fertility and the proportion of parity-two women who want no more children (not shown); in this case, the R^2 is .80.

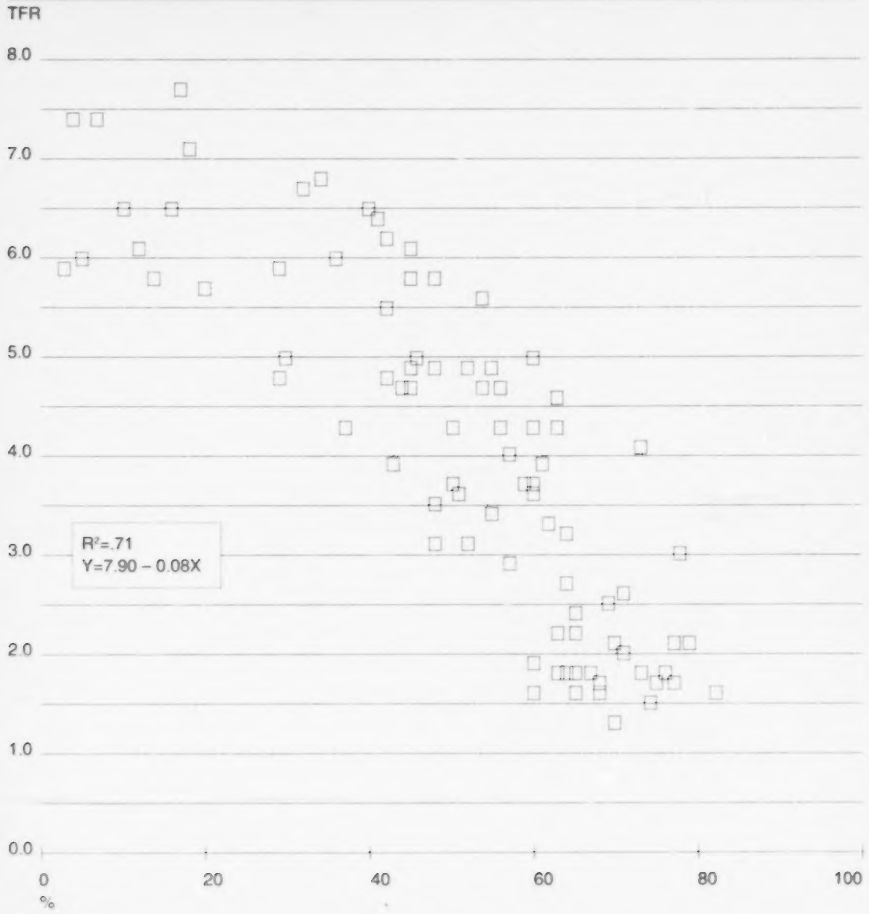
Since there is a high serial correlation between fertility rates at two points close in time, other measures of change were explored, such as the amount or rate of change in the TFR and in the proportion who want no more children, but this effort proved unrewarding: The associations were statistically significant but low. It is probably demanding too much of the data to take such an approach, since the time intervals between fertility and the measurement of reproductive intention are not the same for all of the countries. Moreover, the amount of change in intention is influenced by the initial level.

To address the issue of serial correlation, we estimated the partial correlation between reproductive intentions and the subsequent TFR while holding the initial TFR constant in the few years prior to the survey. The result was a drop in the value of the initial correlation, from –.84 to –.29. However, this should be regarded as an extreme test of the contribution of intentions, since the correlation between the TFRs at two points so close in time is very high (.97). For what it is worth, the fertility rate at a given time is clearly the best single predictor of the fertility rate following a short interval; on the other hand, reproductive intentions have some validity for the short-term prediction of fertility, and such a measure may therefore be of interest as a dependent variable in its own right.

As was noted earlier, the effect of reproductive intentions on fertility appears to operate primarily through the intermediate variable of contraceptive practice. The statistical procedure of path analysis can elucidate these connections and can permit quantification of both the direct effect

*For some countries, the measure is the average TFR over the five-year period preceding the second survey; for others, the measure is the TFR for a particular year about five years later, on average.

Figure 4. Relationship between percentage of married women who want no more children and subsequent TFR,* 87 countries



*An average of five years after data on reproductive intentions.

of intentions on fertility and the indirect effect mediated through the intervening variable of contraceptive practice. As Figure 5 shows, the total effect of intentions on subsequent fertility is seen in the correlation of –.84, of which 70 percent is mediated through contraceptive prevalence and 30 percent is a direct connection. We can only speculate about the nature of this direct connection; it probably operates mainly through abortion, and perhaps is also influenced by variations in coital frequency and durations of breastfeeding.

Age-Specific Fertility

So far, this analysis has focused on the relationship between the TFR and the overall proportion of women who want no more children. To test the relationship at a more disaggregated level (and with the hope that it might elucidate the underlying structure of this relationship further), the data were divided into five-year age-groups. For each country for which suitable national data were available, a file was constructed to include age-specific estimates of the proportion of married women who wanted no more children, of the proportion of married women who were currently using contraceptives and of fertility itself. Since we are interested in how accurately intentions predict fertility, the analysis is focused on the relationship from one age-category to the next—for example, between the proportion of women 25–29 years of age who wanted no more children and the fertility rate of women 30–34 years of age five years later (typically, averaged over the preceding five years).

The results support the earlier analysis: On a base of 299 observations, 70 percent of the variance in the age-specific fertility rates was explained by the proportion of women who said they wanted no more children. One difficulty with pooling age-specific rates, however, is that we capitalize on the strong connections that age has with both intentions and fertility. If initial age is held constant and the partial correlation between initial intentions and subsequent fertility is estimated, the magnitude drops from –.84 to –.48, and the proportion of the variance explained falls to 23 percent. Of course, age is closely involved in the basic connections between reproductive intentions and fertility.

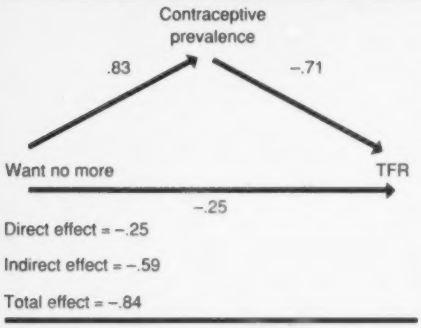
The more direct way to evaluate how well age-specific fertility rates can be predicted from intentions to terminate childbearing is to examine the association separately for each age-group. This limits the sample size, however, since there are only 47 populations for which the requisite data (age-specific reproductive intentions, with age-specific fertility rates measured in a succeeding period) are readily available, compared with the 84 populations in the preceding analysis with the TFR. With some caution about statistical stability (although all results are statistically significant), we present estimates in Table 1 of the percentage of the variance explained. For purposes of comparison, the predictive value of contraceptive prevalence is shown as well. It is clear that this behavioral variable accounts for considerably more of the variance in fertility than does intention: The estimated R^2 for reproductive intentions and fertility at age 15–19 is particularly low (.09); this is not surprising when we consider that few teenagers report not wanting any more children (an average of 14 percent across the 47 countries). In addition, adolescence is a transitional stage during which young women generally move from single to married status, further obfuscating the relationship. For the opposite reason, the value at the oldest age is also of little interest, because large proportions of older women (an average of 79 percent) want no more children and because their fertility is extremely low.

Besides the fact that prevalence, unlike intention, is a measure of behavior, one of the reasons that contraceptive prevalence is a better predictor of fertility among women younger than 40 than the intention to cease childbearing is that contraception is also practiced by many couples younger than 40 who want more children but who want to postpone or space births. This is, of course, reflected in short-term period fertility rates.*

Why is reproductive intention so much better a predictor of the TFR than of age-

*Data on spacing intentions are primarily available only among countries participating in the DHS. Thus, it is impossible to estimate their association with subsequent fertility.

Figure 5. Path diagram of the direct and indirect effect of reproductive intentions on TFR



specific fertility rates? One may argue that higher levels of aggregation lead to higher associations because they dampen much of the error variance, but this effect is not so apparent with contraceptive prevalence, which shows a strong association with age-specific fertility rates, as it does with the TFR. As noted above, contraception is also practiced by women who want more children but who want to postpone fertility. Undoubtedly, the covariation of age both with reproductive intentions and with fertility augments the association with the TFR. Perhaps the explanation lies in the notion that the TFR is a surrogate for completed fertility and that wanting no more children is an index of having reached that point. At any given time, women are either trying or not trying to avoid having another child. Such behavior, in the aggregate, is reflected directly in the period TFR, quite aside from whether couples do or do not have any explicit family size in mind. This kind of symmetry is not present so clearly in the connections between wanting or not wanting to terminate childbearing at one age and the fertility rate at the next older age.

Conclusions

Information on reproductive intentions is clearly important to those concerned with trends in fertility. The measurement of these intentions, on the other hand, has long been regarded with skepticism by critics of family planning research. The analysis reported here is an attempt to evaluate the validity of one of the most widely used such measures, the stated intention or preference not to have any more children. Earlier studies of the validity of intentions have concentrated on whether the fertility of individual women is consistent with their earlier stated intentions; the present analysis focuses on the aggregate level and addresses the question of how closely the proportion of women who report wanting no more children relates to the fertility rate.

The results demonstrate a high level of validity, with about three-quarters of the variance in the TFR associated with the percentage of women who reported that they want no more children. The association between the TFR and the contraceptive prevalence rate is higher (R^2 of .91). Contraceptive practice is, of course, the link between intentions and fertility, and the R^2 between intentions and prevalence is .78. The "unexplained" part of this variance (aside from measurement error) is composed of those women who want no more children but who are not practicing contraception (those with an unmet need) and women who are practicing contraception for spacing rather than limiting births.

Intentions and prevalence are current-status estimates, whereas the TFR is assessed for the recent past; thus, there is the possibility that intentions are influenced by fertility. Several further analyses intended to circumvent this problem by examining the relationship between intention and fertility several years later and the associations with intention for women with exactly two children revealed similar high correlations.

The same general type of analysis was also undertaken at a lower level of aggregation, at the level of the age-specific fertility rate. The results are similar, although the predictive values are much lower than for the TFR. The conclusion seems clear: The measurement of reproductive intentions has a high level of aggregate validity, and its inclusion in fertility and contraceptive surveys is amply justified.

Table 1. Percentage of the variance in age-specific fertility rates explained by women's initial reproductive intentions and contraceptive prevalence, by age-group, 47 countries

Age-group	% of variance explained by:	
	Intentions	Prevalence
15–19	9	52
20–24	27	73
25–29	28	66
30–34	47	67
35–39	38	64
40–44	45	47

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Resumen

Una determinación de si el deseo declarado de terminar de tener hijos predice con exactitud la fecundidad, utilizando datos nacionales de 134 encuestas realizadas en los últimos 10–15 años, revela que existe una importante relación entre la tasa global de fecundidad y el porcentaje de mujeres que no desean tener más hijos, aun cuando la comparación se restringe únicamente a los países en vías de desarrollo. Más de dos tercios de esta fuerte asociación se actua a través de la prevalencia de anticonceptivos. Los análisis posteriores confirman la relación entre intención y fecundidad en el transcurso del tiempo en países para los cuales se disponían de dos fuentes de datos separadas por cinco años aproximadamente (en promedio). Se llegó a la conclusión de que la proporción de mujeres que declararon no desear más hijos tiene una validez de predicción muy elevada, siendo, por lo tanto, un instrumento útil en el pronóstico de la fecundidad a corto plazo.

(Continued on page 96)

Results of a Contraceptive Prevalence Survey in Niamey, Niger

General knowledge of contraceptives is high among younger women in Niger, but levels of use remain low. No respondent younger than 20 admitted using modern contraceptives, yet 90 percent said they were interested in family planning.

By Maria J. Wawer, Lynne Gaffikin, Voahangi Ravao, Halima Maidouka and Kadi Traoré

Summary

A community-based knowledge, attitudes and practices survey was conducted among women in Niamey, Niger, more than two years after the initiation of the first public-sector family planning program in 1984. Prevalence of modern method use was nine percent among women aged 15–49 and 10 percent among those currently in union, which may represent one of the highest levels in the Sahel. Eighty-seven percent of respondents indicated interest in using family planning in the future. More than 75 percent of all women of reproductive age knew of at least one modern method without prompting: Radio and television had reached a larger proportion of the population with family planning information than had the more traditional method of communication, the community meeting. Survey and focus group results indicate a general acceptance of birth spacing as well as a need for more personalized communication by program staff and clarification of Islam's position on family planning.

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Introduction

The francophone Sahelian countries of Africa* have very low rates of modern contraceptive use. The 1986 national Demographic and Health Survey (DHS) in Senegal indicated that 2.6 percent of all women of reproductive age were using a modern method,† rising to 6.7 percent among those currently in union residing in urban areas.[1] For the subgroup of women in union living in the capital city of Dakar, the rate was 7.5 percent.[2] A 1987 survey in Ouagadougou, the capital of Burkina Faso, indicated a rate of modern contraceptive use of 4.9 percent among women of reproductive age currently living in union.[3] Recently, use of modern methods was reported by only 1.2 percent of women in union who live in urban areas in Mali.[4]

Nonuse of modern methods in the Sahel has been attributed to many factors, including the desire for multiple offspring because of the economic value of children and because of relatively high infant and child mortality rates; conservative attitudes about the role of women; lack of family planning information and services; and government policies inimical to contraceptive distribution. The French law of 1920, which prohibited contraceptive promotion and distribution, remained in force into the 1980s in all but one of the Sahelian countries.[5]

Niger, a landlocked country in the Sahelian region, has a total estimated population of 7.2 million, and an annual rate of growth of approximately 3.1 percent,[6] based on preliminary estimates from the 1987 national census. Niger is one of the poorest countries in the world: The World Bank estimates that the annual per capita gross national product in 1986 was U.S. $260.[7] Economic problems in the 1970s and 1980s, engendered by the oil crisis and severe drought, led to the recognition by Nigerien policymakers that the already inadequate social services could not keep pace with the growing population. This realization, and a growing appreciation of the health benefits of adequate childspacing, resulted in both the abrogation of the 1920 law prohibiting contraception and the development of a population policy. In November 1984, the Ministry of Public Health and Social Affairs (MOPHSA) instituted Niger's first official family planning program, in the capital city of Niamey. The program was vigorously supported by the highest levels of government, including the president. Its focus was the Centre National de Santé Familiale (CNSF), located in a residential area, which served as a family planning clinic and as the primary family health training and research center for the country.

Before the inauguration of the CNSF, a small number of private and public-sector physicians and midwives in Niamey had offered limited family planning services, consisting primarily of dispensing oral contraceptives. However, when the CNSF opened, the ministry requested that all other public-sector family planning services be temporarily stopped so that program planning, service delivery and training for family planning providers could be consolidated within the CNSF. Consequently, it became virtually the sole source of public-sector contraceptive supplies in the capital city until 1987, when limited services were decentralized to maternal and child health clinics.

During its first two and a half years of operation (1984–1987), the CNSF offered oral contraceptives, injectables, IUDs and male and female barrier methods. Care was provided by trained midwives, who

*Burkina Faso, Chad, Mali, Mauritania, Niger and Senegal.

†Modern methods as defined here are oral contraceptives, the IUD, injectables, female barrier methods, condoms and voluntary sterilization.

referred patients needing medical evaluations or procedures (including tubal ligations) to physicians in private and public-sector clinics. CNSF medical and social service staff also provided gynecologic and limited pediatric services, conducted contraceptive service delivery research and participated in family health information, education and communication (IEC) activities.

The IEC involved use of mass media as well as community outreach programs. CNSF staff gave numerous radio, television and newspaper interviews about the benefits of childspacing, and obtained media coverage of all conferences held at the center, at which the presence of national religious and political leaders was highlighted. For example, three months after the inauguration of the CNSF, the MOPHSA cosponsored a national conference on family health, which brought together representatives from relevant ministries and influential religious and secular leaders, along with the press.[8] Discussions and statements supportive of childspacing made by religious and political leaders received wide publicity.[9] Other news stories regarding the CNSF and its services appeared regularly in the media.

For the community outreach component, a team of CNSF and MOPHSA staff conducted a series of IEC meetings in the 50 Niamey neighborhoods in 1986. (Such talks are a traditional means of providing information in Niger communities.) The number of new and return visits to the CNSF increased by 25 percent during the first two months following these meetings, but dropped within three months to its previous level. In 1987, the CNSF conducted 25 additional meetings, with a stronger family planning message, in half the neighborhoods. Local residents were invited to attend these meetings, which were held in the evening and lasted about two hours. Each session was conducted by a trained CNSF staff member who discussed the advantages of family planning and described the various methods. Women were invited to visit the CNSF for family planning advice and contraceptive services; men were advised to encourage their spouses to visit the center or to do so themselves, to receive condoms. Between 200 and 350 adults attended each meeting, for a total of 7,000 participants (of an estimated adult population of 100,000 in the intervention neighborhoods); about twice as many women as men attended.

Before proceeding with additional activities, including decentralization of services, the MOPHSA wished to answer a number of questions: Are community meetings an effective way of reaching the population with family planning messages? What proportion of the Niamey population is receiving family planning services? What characteristics are associated with attendance at the CNSF and with acceptance of family planning?

An operations research project was developed to explore these questions. Two community-based knowledge, attitude and practice (KAP) surveys were conducted (one with men and one with women) and several focus groups were held to assess the effects of the CNSF service delivery and IEC efforts. This article summarizes the results of the female KAP survey and focus groups. Male KAP results are reported elsewhere.[10]

Methods

The female KAP survey was conducted during a six-week period in April and May 1987, following the second round of neighborhood family health information sessions. The 50 neighborhoods of Niamey were stratified into three socioeconomic levels on the basis of housing quality and population density. Twelve neighborhoods were randomly selected by socioeconomic strata, to yield two high-, six middle- and four low-income neighborhoods to be included in the survey.

Subsequently, in each of the 12 neighborhoods, five clusters of 20 households were randomly chosen. Each cluster was visited prior to the survey to conduct a census of eligible women in each household and to randomly identify one eligible respondent per household to be interviewed. Eligibility criteria for respondents were age (15–49 years) and residence in Niamey for at least six months of the previous year. In all, 100 women were selected per neighborhood (20 women in each of the five clusters in each neighborhood), for a projected sample of 1,200 respondents.

A total of 1,149 interviews were successfully completed. Only seven subjects refused to be interviewed; another 44 could not be reached despite three return visits to the household. The KAP data were weighted to adjust for neighborhood size in relation to the overall population of the city, and for the number of eligible women present in each sample household, since the sampling scheme underrepresented women residing in multiple female households (including women in polygynous households). Overall KAP results are reported for the weighted sample. In reporting contraceptive prevalence, selected data are also presented. Each use of such data is noted in the text.

Six focus groups on family planning issues were conducted: two with young unmarried women, two with young mothers (aged 19–24) and two with older mothers (aged 25 and over). These participants were chosen from households identified by community leaders in the various neighborhoods. Group facilitators were trained social workers from the CNSF and the development division of the city of Niamey. The group sessions, each lasting approximately 1.5 hours, were tape recorded, and a trained observer was present to record interactions and take notes.

Background Characteristics

Major social and demographic characteristics of the respondents are shown in Table 1 (page 92). The average age of the women was 27.3 and nearly 98 percent were Muslim (not shown). More than two-thirds of the sample had migrated to Niamey after age 12, and most of the migrants came from rural zones or smaller Nigerien cities. The migration data are compatible with the rapid growth of Niamey: In 1977, its population was approximately 240,000; by 1987, estimates placed the population at 400,000.[11]

Fifty-three percent of the women in the sample had received no formal education and another eight percent had attended Koranic school, which is primarily religious education. Slightly more than 60 percent said they were unable to read a letter or a newspaper. Thirty-nine percent of the respondents reported being involved in income-generating activities. As one measure of socioeconomic level, respondents were questioned about household possessions, specifically radios, televisions, cars, motorcycles or motor scooters. Twenty-nine percent reported having no such equipment, and 34 percent had no radio or television. (The distribution of radios and televisions is shown in Table 1.)

Forty-six percent of the women were currently in monogamous marriages, and 28 percent were married to men who had at least one other wife. Eight percent were in consensual unions, defined as partners residing together continuously or for portions of the year without formal marriage. Just over 10 percent of women younger than 25 were in polygynous unions, a proportion that increased to almost half among those older than 35. The data suggest a trend away from polygynous marriages; however, since the husbands of these younger women also tend to be younger, and may enter into additional

Table 1. Percentage distribution of respondents (N=1,149), by selected characteristics, Niamey, Niger, 1987

Characteristic	%
Age	
15–19	18.7
20–24	22.5
25–29	21.0
30–34	16.9
35–39	11.5
40–44	7.1
45–49	2.0
Unknown	0.3
Residence before age 12	
Niamey	32.1
Other city	10.9
Rural	45.2
Other country	11.7
Unknown	0.1
Education	
None	53.4
Koranic	7.6
Primary	17.3
Secondary/postsec.	21.3
Unknown	0.4
Profession	
Housewife	52.7
Small commerce/agriculture	32.3
Skilled worker	6.7
Student	8.2
Unknown	0.1
Household possessions	
Television and radio	31.4
Television only	2.5
Radio only	31.6
Neither	34.1
Unknown	0.4
Marital status	
Monogamous	45.8
Polygynous	28.1
Consensual union	7.8
Single/widowed divorced/separated	18.3
Ethnic group	
Djerma	46.0
Haoussa/Peuhl	27.3
Other Niger	16.1
Other country	10.6
Total	100.0

marriages in later years, the data are inconclusive. The two major ethnic groups in Niamey, the Djermas and the Haoussas, are generally more urbanized and more highly educated than other groups that have more recently migrated to the city.

Average age at first marriage for the 918 ever-married women in the sample (not including those in consensual unions) was 15.6 years; 15 percent were younger than 13 when they married. Age at first marriage did not vary significantly by ethnic group, but marked differentials were noted by age-group, level of education and whether the respondent was in a monogamous or polygynous marriage (Table 2). Given that slightly more than half of the women younger than 20 had not yet entered into a formal marriage, the average age at first marriage for this cohort will increase with time as more of these young women enter into union.

Fifteen percent of the currently married women in the sample were pregnant at the time of the survey. (Seven percent of the 89 women who were in consensual unions, but not formally married, were also pregnant.) The average number of live births among the 918 ever-married women in the sample was 4.2. Table 2 shows parity for ever-married women by education, marital status and age. Parity was lower among women with higher educational levels and among those in monogamous marriages.

Standardization by age reduced, but did not eliminate, the parity differentials associated with education and type of marriage. Because data on duration of marriage by type of union were not collected, standardization of parity for this variable was not possible. Of the 918 ever-married women, 839 had experienced a live birth. Half of these women had their first birth before age 18. Average age at first live birth increased from 17.6 for women with no schooling or only Koranic education to 18.4 years for women who attended primary school and to 20.3 years for respondents who had received secondary or postsecondary education. Similarly, women in the lowest socioeconomic group (as measured by a lack of all the household possessions listed previously) experienced their first live birth at 17.7 years on average, compared to 19.3 years for women in the highest group (as measured by the possession of a car and at least one other item, such as a radio, television, bicycle or motorcycle.)

On average, each woman had experienced the death of 0.8 children. The average number of infant or child deaths increased from 0.2 among mothers with at least some secondary education (a ratio of one death per 14 live births) to 1.0 among those with no schooling (a ratio of one death per 3.9 live births). Of the 918 ever-married women interviewed, 728 had at least two children. The average interval between the last two births was 35 months, which closely approximates the three-year spacing considered ideal by the majority of respondents. However, 30 percent of women with two or more children reported 24 months or less between their last two births. (When possible, interviewers verified childrens' birth dates by examining civil registration cards.)

Traditional postpartum abstinence in Niamey tends to be relatively short, in keeping with the Islamic practice of 40 days of abstinence. A quarter of respondents had abstained for only one month, and another quarter for two months. Fewer than 10 percent of respondents reported abstaining for more than six months. The average duration of breastfeeding was 19.8 months. Shorter breastfeeding durations were associated with more education and with higher socioeconomic status.

Table 2. Among ever-married respondents (N=918), average age at first marriage* and mean number of children ever born, by selected characteristics

Characteristic	Age at marriage	Number of children
Total	**15.6**	**4.2**
Education		
None	14.5	4.7
Koranic	15.1	4.0
Primary	16.7	3.8
Secondary/postsec.	19.4	2.8
Marital status		
Polygynous	14.8	5.1
Monogamous	16.1	3.9
Age		
<20	14.7	1.4
20–24	15.5	2.2
25–29	16.5	3.6
30–34	15.9	5.1
35–39	15.1	6.2
40–49	14.6	7.7

*Refers to formal marriage.

For the sample as a whole, the average desired number of children was 5.4. Women who did not yet have children indicated on average that they desired 4.4 children (a mode of three children), while those who already had children indicated that an average of 5.8 children (a mode of five) were desired. When women with living children were asked how many additional children they wanted, the mean total desired family size (determined by adding current plus wanted children) was 5.9. Fewer than 15 percent of respondents stated they did not know how many children they desired or gave nonnumeric answers such as "It's God's decision." Eighteen percent of all respondents said they did not want to have any additional children, a proportion that increased to 25 percent among women aged 30–34, and to 56 percent among those aged 35–49. Twenty-one percent of women with 3–5 children desired no more, as did almost 60 percent of women with six or more children.

Contraceptive Knowledge and Use

Knowledge of modern family planning methods in this population was high. Seventy-six percent of all respondents could

Table 3. Percentage of respondents who know of, ever used and currently use contraceptive methods, by method (N=1,149)

Method	Knowledge (prompted)	Ever use	Current use
Modern	**92.7**	**15.4**	**8.5**
Pill	85.5	10.7	3.9
IUD	78.5	3.9	2.2
Tubal ligation	80.5	0.9	0.9
Injectable	70.3	1.7	0.7
Condom	47.3	2.3	0.6
Spermicides	28.3	1.5	0.1
Other	**78.1**	**30.5**	**16.9**
Abstinence*	57.5	17.0	4.4
Rhythm	57.1	20.3	7.6
Withdrawal	31.9	8.8	2.9
Traditional	66.4	9.4	2.0

*Most cases refer to postpartum abstinence.

name at least one modern contraceptive method without prompting, and 93 percent recognized at least one method with prompting (Table 3). Knowledge of all methods was highest in the 30–34 age-group, and lowest among women under 20. However, even in the latter group, upon prompting, 79 percent recognized at least one modern method.

Knowledge of more traditional methods of family planning (withdrawal, abstinence, rhythm based on traditional systems, charms and herbs) was lower than that of most modern methods. The highest levels of knowledge of rhythm and abstinence were found in respondents older than 40. Interviewers were trained to probe for a distinction between knowledge of traditional rhythm methods and modern natural family planning. No evidence was found of usage of modern calendar methods, basal body temperature, or cervical mucus monitoring—findings that are compatible with the absence of a natural family planning program in the city.

The current prevalence rate of modern method use, weighted for neighborhood size and the number of eligible women per household, was 8.5 percent, a high level for a Sahelian city. Another 17 percent of the sample reported current use of other methods (withdrawal, rhythm, abstinence, and traditional charms and herbs). In the original unweighted data, use of modern methods was reported by 11 percent of respondents, and use of traditional methods by 18 percent. Thus, more than a quarter of all respondents report current attempts to control their fertility.

When use of modern methods was examined by subgroups, weighted prevalence was 10 percent for women currently in union and 15 percent for the group of respondents who were currently married, not pregnant and not likely to be practicing postpartum abstinence. Oral contraceptives represented the modern method used most frequently, followed by the IUD. Just under one percent of the sample reported use of tubal ligation; these responses were found to be plausible with respect to age and parity. (Tubal ligation is performed in Niamey for health reasons, although it is possible that some women confused other gynecologic procedures for tubal ligation.) No respondent under the age of 20 reported current use of a modern method, although seven percent of women in this age-group reported use of traditional methods, including withdrawal and rhythm. Current use of modern methods was highest in the 30–34 age-group, at 16 percent. The relationship between age and use of modern methods was highly significant ($p<.001$, by Chi square).

Current use of modern methods also varied significantly according to number of living children, education, marital status, place of residence until age 12, ethnicity and neighborhood socioeconomic level (Table 4). The proportion of women currently using a modern method increased from one percent among women with no children to 15 percent among those with six or more, and from five percent among women with no formal education to 14 percent among those with primary schooling. Rates of contraceptive use were higher among women in monogamous marriages and among those who had lived in Niamey since childhood (11 percent each) than among comparison groups. Differences among ethnic groups were not large but were statistically significant at $p<.05$.

Table 4. Percentage of women currently using modern methods, by selected characteristics

Characteristic	%	N†
Age**		
15–19	0.0	215
20–24	6.9	258
25–29	10.1	241
30–34	15.8	194
35–39	10.9	132
40–44	9.8	105
Living children**		
None	1.3	295
1–2	8.7	321
3–5	10.5	345
≥6	14.9	186
Education**		
None	5.3	614
Koranic	7.9	87
Primary	13.6	199
Second./postsec.	12.2	245
Marital status**		
Monogamous	11.4	526
Polygynous	7.3	323
Consensual union	9.6	90
Single/div./wid.	2.8	210
Ethnic group*		
Djerma	8.8	532
Haoussa	8.7	314
Other Nigerien	6.5	181
Non-Nigerien	9.7	122
Residence before age 12*		
Niamey	11.4	369
Other city, Niger	8.4	125
Rural Niger	6.3	519
Neighborhood socioeconomic level‡		
High	27.2	180
Medium	9.1	578
Low	2.9	391

*Statistically significant at $p<.05$, Chi square test.

**Statistically significant at $p<.001$, Chi square test.

†Total is 1,149; not all add to total because of missing data.

‡Unweighted by population size.

The contraceptive prevalence rate (unweighted for neighborhood population size) among the combined population in the four poorest neighborhoods was three percent (range, 0–5 percent), rising to nine percent in the six intermediate neighborhoods (range, 7–12 percent) and to 27 percent in the two neighborhoods of highest socioeconomic level (23 percent and 31 percent, respectively). The rate was five percent among the 338 women who did not have a radio, television, motorcycle or car, and 23 percent among the 229 women who had a car and at least one of the other possessions (not shown).

Just over 15 percent of all respondents reported ever-use of modern methods. Of the 79 women (seven percent of all respondents) who had previously used a modern method but were not currently doing so, approximately half were not using any family planning method and half stated they had switched to a traditional method. (Since modern methods were not readily available prior to the inauguration of the CNSF in late 1984, many of those who discontinued use of these methods had probably started using them within the two and a half years since the program began.) Only one-third of women who had ever used the pill were still using oral contraceptives at the time of the survey. Half of the respondents reporting ever-use of the IUD or injectables were current users of these methods. The lowest rate of continuation was found among ever-users of barrier contraceptives; only one-quarter of this group were still using such methods.

Forty percent of previous users of modern methods indicated they were currently pregnant, had been so recently or desired a child. A quarter reported health concerns,

cost and distance to service sites as reasons for discontinuation. Additional reasons, each cited by fewer than five percent, included menopause, spouse's objections or no current sexual relations. Twenty-five percent provided no reason for discontinuation.

The CNSF represented the single most important source of contraceptives in Niamey, cited by 55 percent of current users. Maternal and child health clinics and maternities were cited by 38 percent of current users, a finding that is compatible with the 1987 decentralization of family planning services to selected sites. Ten percent of respondents named other sources, such as clinics in the private sector. (Respondents could name more than one source of methods. A proportion of those naming maternities may have received contraceptives from private maternity centers; the questionnaire did not differentiate private from public-sector sites.) Two-thirds of all respondents had visited a maternal or child health care center at least once during the two years prior to the survey, suggesting that these centers are important sites for providing family planning information and services.

The most common reasons given for not using family planning were recent, current or desired pregnancy (mentioned by 33 percent of nonusers) and lack of information, particularly personalized communication (reported by 25 percent of nonusers). The latter group made statements such as: "No one talked to me about family planning," "I've never thought of it," or "I need more information." Husband's disapproval, religious constraints, fear of health effects and difficulty in acquiring methods were each cited by fewer than five percent of respondents. Only one-third of the women said that they had ever discussed family planning issues with their spouses, and only two percent named their husband as an important source of information on the subject. Eighty-seven percent of respondents indicated an interest in using family planning in the future. The proportion showing such interest was highest among women aged 15–24 (95 percent) and lowest in the 40–49 age-group (44 percent).

One goal of our survey was to assess the effects of the family planning IEC efforts. A total of 132 respondents (12 percent) indicated they had attended a family planning meeting. Within this group, 82 said they had been present at the most recent series of meetings, held in the 25 neighborhoods in 1987. Attendees demonstrated enhanced knowledge of family planning methods: Ninety percent spontaneously cited at least one modern method, compared with 74 percent among other respondents. However, no statistically significant differences in contraceptive prevalence rates were found between those who said they had attended any of the CNSF sessions and those who had not. Almost 12 percent of all respondents said they knew someone who had attended a meeting, and 15 percent said they had received family planning information as a result of the meetings, either directly or from another person who attended.

The importance of community meetings as sources of information for the population as a whole appears relatively limited compared to that of the mass media. When respondents were asked to name sources of family planning information, 63 percent stated they had received information directly from the media, particularly radio and television. (As noted earlier, two-thirds of respondents had a radio, television or both in the home, and almost 40 percent were literate.) Next in importance as sources of information were maternal and child health clinics (30 percent) and friends (29 percent).

Focus Groups

Focus-group participants generally expressed positive attitudes regarding family planning and the use of contraceptive methods. Reasons frequently cited for this were the need for women to rest between pregnancies, the desire for healthy infants and, to a lesser degree, financial considerations. Participants indicated that childspacing had traditionally been practiced in Niger. Women were aware that the duration of breastfeeding was becoming shorter, and that closely spaced births were more common. Although a few women expressed the belief that frequent births were hereditary and thus could not be avoided, or that only God can select the timing and number of children a couple has, more common remarks included:

"A long space between children is good, since everyone wants strong children."

"I know how bad having many babies close together can be for one's health, because I saw my sister suffer in this way."

"I don't want to have too many children, because life these days is very expensive."

"Before, there weren't many babies born close together because women didn't get their periods after the last birth for a year or more. Now, women see their periods very soon and get pregnant quickly."

Comments about family size revealed a desire for fewer children, compared with traditional family norms. Typical comments included:

"I want only three children because life these days is so expensive."

"I don't want to have more children than I could care for myself, if necessary."

"Having more than five children these days is very hard. I wouldn't want to do it."

Although much of the discussion centered on the desired number of children, participants generally expressed more comfort with the idea of childspacing than with the idea of deliberately using contraception to limit family size. Concern was voiced that the Islamic religion sanctioned the former but not the latter, except in cases of severe health risk:

"A long space between births is fine, but you shouldn't decide on the number of kids you have."

"The Koran accepts childspacing . . . and even limiting the number of babies a woman has, but only if her life is in danger."

"If you only have a few children, what will happen if some die?"

Few concerns arose regarding health risks associated with the use of contraceptives. However, the perception that men may be less favorably disposed to family planning was raised, and participants tended to agree that women did not discuss the issue with men very openly:

"Our [male] friends and spouses won't want us to use modern methods, because they think we'll be unfaithful to them."

"Men want lots of kids; it makes them feel strong."

Responsibility for avoiding unwanted pregnancies was generally, but not exclusively, acknowledged to be the woman's:

"It's a girl's responsibility [to take precautions], because once you're with [your boyfriend or partner], you can't refuse."

"There are a few young men who buy . . . methods . . . to avoid having children."

Discussion

Survey data indicate that the female population of Niamey has many characteristics common to African societies: early age at first marriage and childbirth, high parity and a relatively long breastfeeding period. In addition, the proportions of respondents aged 25–39, of those having received any formal education, of those in polygynous union, and of those reporting the presence of a radio or television in the household were similar to the proportions determined in separate community surveys conducted in Niamey and other capital cities of the Sahel.[12] Socioeconomic status, as measured

by educational levels and household possessions, was low for the majority of respondents.

Nonetheless, the prevalence rate of use of modern contraceptive methods—nine percent among respondents aged 15–49 and 10 percent among those currently in union—was higher than expected, and may be the highest of any Sahelian capital city. The rate is encouraging because the official government family planning program (the predominant source of contraceptives reported by respondents) was initiated only two and a half years prior to the survey. Dakar is the only other city in the region with a documented contraceptive prevalence rate in a similar range (eight percent among women in union),[13] and the family health program in Senegal officially started almost a decade earlier.

Sociodemographic variables associated with greater use were similar to those found in other African surveys: higher educational and socioeconomic levels, higher parity and age between 30 and 35 years. Urbanization, as measured by residence in Niamey before age 12, was also associated with greater use. Even among women with no education, however, more than 70 percent could spontaneously name at least one modern method and more than 50 percent indicated an interest in using contraceptives in the future. Average desired family size among women who do not yet have children is just over four, a substantial decline from African levels in the past.

Results from this cross-sectional survey cannot be used to determine the rapidity of family planning acceptance in Niamey. However, the limited data available suggest that the new government family planning program is contributing to a trend of increased contraceptive use. In a 1985 study, 166 randomly selected first-time clients of the CNSF were interviewed a few months after the center opened; although 80 percent of the new clients sought family planning services, only 6.6 percent were already using a modern method.[14] Given that women who attend clinics are more likely to use contraceptives, this prevalence rate probably represents an overestimate of general contraceptive prevalence in 1985.

Two subsequent community-based IEC surveys were conducted in Niamey in 1988 and 1989. Women in both surveys were selected through random household cluster sampling similar to that used in the study described in this article. In the 1988 survey, 13 percent of the respondents of reproductive age reported current use of modern methods, as did 22 percent of those in the 1989 survey.[15] Respondents in the 1988 survey were questioned about their source of contraception, and more than 90 percent reported receiving their services from the public sector (as did more than 80 percent of current users in our survey). Since the samples were not all drawn in the same manner and the respondents may not be directly comparable, these data cannot be interpreted as definitive proof of an increase in prevalence between 1985 and 1989. However, the results suggest a trend and may indicate that, where service delivery exists and is well publicized, an increase in contraceptive prevalence levels can occur fairly rapidly even in a conservative African Moslem city such as Niamey.

Our survey results show that community meetings—a time-honored Nigerien method of providing information to the general public—may not serve a particularly efficient role in promoting family planning. The proportion of persons reached directly by the meetings is low compared with those who receive their information from the mass media, as two-thirds of respondents reported that they did. Survey data also show relatively high levels of spontaneous and prompted knowledge of at least one modern method (76 percent and 93 percent, respectively). In such a setting, additional gains in knowledge can be marginal at best. Contraceptive prevalence levels among community meeting attendees (the group most directly touched by the program) were not statistically different from the overall survey population.

The KAP survey and focus-group data suggest several options for program improvement. Among these are interventions that may decrease contraceptive dropout rates. Although it is recognized that 40 percent or more of those who discontinued use may have done so because they had been using a method for spacing and stopped to have another child (a percentage similar to that found in the 1988 IEC survey), another 25 percent appear to have discontinued use because of health concerns, cost or distance to service sites. The family planning program in Niger could address these barriers by providing personalized counseling, with greater emphasis on selection of the most approriate method for each client, follow-up of those who discontinue use and wider dissemination of the information that contraceptives are provided free of charge to women with financial need.

Outreach and education targeting underserved groups, including younger women and residents of lower socioeconomic neighborhoods, represents another potential opportunity to increase contraceptive use. Outreach directed toward young women is particularly important, given the early age at first marriage and first birth among women in Niger. General knowledge of contraceptives and interest in family planning appear to be high among younger women, but levels of use remain very low. For example, no respondents younger than 20 admitted use of modern family planning methods, and only five percent in this age-group used withdrawal or rhythm, but 90 percent said they were interested in family planning. The KAP finding that nonusers indicated they "had never thought of family planning" suggests that more personalized messages stressing the relevance of family planning for individuals with various life situations and needs may be effective in future IEC efforts.

Focus-group data reinforce the impression that the concept of childspacing and contraceptive use are well accepted and that family size norms are declining. Clarification of Islam's position on family planning (which includes the concept that each family should not have more children than it can care for)[16] may require further emphasis through the mass media and other avenues of communication, such as religious gatherings. In the male KAP survey conducted in Niamey in the same time period as the women's study reported here, the majority of the men interviewed expressed positive attitudes towards family planning. Such data need to be publicized to encourage more discussion of these issues between partners.

Assisted by survey findings (particularly the widespread acceptance of the idea of family planning), the recently created Direction de la Planification Familiale in the Ministère des Affaires Sociales et de la Promotion de la Femme, the CNSF and the MOPHSA are strengthening two aspects of their program. With donor support, they are developing IEC strategies that concentrate on the mass media approach and include nondidactic forms of delivering messages, such as dramas. In addition, they have decentralized service delivery points within Niamey and expanded services outside the city, and are exploring the possibility of training paramedical staff in family planning.

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Resumen

Se realizó una encuesta comunitaria acerca de los conocimientos, actitudes y costumbres entre las mujeres de Niamey, Niger, más de dos años después de iniciarse el primer programa de planifación de la familia organizado por el sector público en 1984. La prevalencia de uso de métodos modernos fue del nueve por ciento entre las mujeres de 15 a 49 años de edad, y del 10 por ciento entre las actualmente en unión, lo cual posiblemente represente la tasa más elevada del Sahel. El ochenta y siete por ciento de las encuestadas expresaron interés en el uso de planifación familiar en el futuro. Más del 75 por ciento de todas las mujeres en edad reproductiva conocían espontáneamente por lo menos un método moderno: la radio y la televisión habían informado sobre la planficación familiar a una mayor proporción de la población que el método de comunicación tradicional, la reunión comunitaria. Los resultados de la encuesta y de los grupos focales indican que hay aceptación general del expaciamiento de los nacimientos, apuntando asimismo que hay necesidad de comunicación más personal por parte del personal del programa y de una aclaración de la posición de Islam con respecto a la planficación familiar.

Résumé

Una enquête sur les connaissances, les attitudes et les pratiques a été effectuée auprès de communautés de femmes à Niamey, Niger, plus de deux ans après la mise sur pied du premier programme de planification familiale dans le secteur public en 1984. Les méthodes modernes étaient utilisées par neuf pour cent des femmes âgées de 15 à 49 ans, et 10 pour cent des femmes alors unies à un homme, ce qui peut représenter l'un des niveaux de prévalence les plus élevés au Sahel. Quatre-vingt-sept pour cent des femmes interrogées ont manifesté un intérêt à utiliser des méthodes contraceptives dans l'avenir. Plus de 75 pour cent de toutes les femmes en âge de procréer connaissaient au moins une méthode moderne sans qu'une description ne leur en soit donnée. La radio et la télévision avaient véhiculé des informations de planification familiale à une proportion plus importante de la population que ne l'avait fait la réunion communautaire, méthode de communication plus traditionnelle. Les résultats de l'enquête et des groupes de discussion indiquent une acceptation générale de l'espacement des naissances ainsi que la nécessité de communications plus personnalisées par le personnel du programme, et le besoin de clarification de la position islamique sur la planification familiale.

Reproductive Intentions and Fertility Rates

(Continued from page 89)

Résumé

Une évaluation du désir exprimé de ne plus avoir d'enfants en tant qu'indicateur valable de fécondité, sur la base de données nationales relevées dans le cadre de 134 études menées au cours de ces 10–15 dernières années, révèle un rapport étroit entre l'indice synthétique de fécondité et le pourcentage des femmes qui ne veulent plus d'enfants, et ce même lorsque la comparaison est limitée aux seuls pays en voie de développement. Ce rapport a pour intermédiaire, pour plus des deux tiers, la prévalence contraceptive. D'autres analyses confirment le rapport entre intention et fécondité à travers le temps dans les pays pour lesquels on dispose de deux sources de données obtenues à environ cinq ans d'intervalle (en moyenne). La conclusion en est tirée que la proportion des femmes qui déclarent ne plus vouloir d'enfants présente une valeur de prédiction élevée et peut donc servir de moyen utile aux prévisions de fécondité à court terme.

Fertility and Its Control: The Puzzle of Sri Lanka

"[A 1985 survey] helped establish what researchers had long believed were the main reasons leading to underestimation of contraceptive practice: Modern methods could be discussed openly, but traditional methods . . . could not."

By Indra Gajanayake and John Caldwell

Summary

The contraceptive prevalence rate reported in the 1975 Sri Lanka Fertility Survey (SLFS) was lower than would have been expected, given the country's low level of fertility. Later surveys, such as the 1982 Contraceptive Prevalence Survey and the 1987 Demographic and Health Survey, showed a pattern of rising prevalence with little change in the level of fertility. In all three surveys, fertility levels predicted from reported contraceptive prevalence were higher than the actual rates, but the disparity was largest for 1975.

The apparent discrepancy between fertility and contraceptive use was caused by substantial underreporting of use of traditional methods in the SLFS and more accurate reporting in successive surveys. Contraceptive use was understated primarily because traditional methods were not perceived by their users as methods of fertility control. Former users of traditional methods, who later accepted sterilization and were less reluctant to report its use, account for much of the observed increase in contraceptive prevalence between surveys.

Introduction

Despite its low per-capita income, Sri Lanka has managed to lower its fertility level remarkably over the last four decades. The crude birthrate, which was 38.1 births per 1,000 women aged 15–44 in the period 1951–1955, had fallen to 28.7 by 1971–1974 and to 28.0 by 1981. In the 1950s and 1960s, the major factors in the declining birthrate were rising age at marriage and declining proportions of women marrying;[1] in the 1970s, marital fertility control had a greater impact.[2]

The decline in Sri Lanka's marital fertility may well be explained by social and demographic factors such as high female literacy and mass education,[3] decreasing infant mortality,[4] high social welfare standards and high aspirations in the face of a worsening economy and increasing unemployment.[5] However, perhaps because substantial resources have been channeled into family planning activities, greater acceptance of modern contraceptives through increased availability and publicity has been considered the major agent of change. In fact, there is evidence that the decline in marital fertility had started before the national family planning program could have had much impact[6] and that fertility control in Sri Lanka probably began with traditional methods. The use of such methods appears to have been widespread enough and effective enough that it kept abortion at fairly low levels.[7]

Fertility levels in Sri Lanka probably never far exceeded those found in the 1970s in many developing countries with fairly high levels of contraceptive use. Indeed, the highest five-year average birthrate on record in Sri Lanka is 40.4 for the period 1926–1930; the highest recorded average number of children ever born, for the period 1895–1925, does not exceed six.[8] In the mid-1970s, in Thailand, the Philippines, the Republic of Korea and Malaysia, countries in which 33–36 percent of currently married women were using a contraceptive method, completed fertility for women aged 40–49 ranged from five to seven children.[9] In 1953, when Sri Lanka had only three family planning clinics,* the number of children ever born did not exceed six and the crude birthrate was 39.[10] Even allowing for underregistration of births (estimated by the Department of Census and Statistics at 12 percent in 1953), Sri Lanka's fertility was low compared with that of the other Asian countries. By 1975, according to the Sri Lanka Fertility Survey (SLFS), contraceptive prevalence among currently married women was 32 percent; nevertheless, the number of children ever born had declined only slightly.[11]

In 1975, the majority of contraceptive users were relying on either traditional methods (41 percent) or sterilization (31 percent). By 1982, when the Contraceptive Prevalence Survey (CPS) was conducted, reported prevalence had increased to 55 percent, with traditional methods accounting for 44 percent of current use and sterilization accounting for 38 percent.[12] The 1987 Demographic and Health Survey (DHS) found that prevalence of contraceptive use in the survey area,† which excluded the northern and eastern provinces, had risen to 62 percent of currently married women;[13] results for the same area from the two earlier surveys yielded contraceptive prevalence rates of 34 percent in 1975 and 58 percent in 1982.[14] DHS data also show that the method mix had changed in favor of modern methods, with

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*Organized family planning activities were already taking place on a small scale with Swedish aid when the government program became active in 1968. The Family Planning Association distributed foam tablets, diaphragms and spermicidal jelly and provided instruction on how to determine the infertile part of the menstrual cycle. (See: A. Kinch, "A Preliminary Report from the Sweden-Ceylon Family Planning Pilot Project," in C. V. Kiser, ed., *Research in Family Planning*, Princeton University Press, Princeton, N.J., 1962.)

†The northern and eastern provinces were excluded from the DHS because of civil disturbances. They contain approximately 14 percent of the population, mostly Sri Lankan Tamils and Moors whose reported use of contraceptives is below that of the Sinhalese.

Table 1. Contraceptive prevalence, effectiveness and combined effect, by year, Sri Lanka, 1975, 1982, 1987

Year	Prevalence (%)	Effectiveness	Combined effect (%)
1975 (SLFS)	32	0.84	27
1982 (CPS)	55	0.83	45
1987 (DHS)*	62	0.87	54

*The 1987 estimates exclude the northern and eastern provinces. Comparable estimates of prevalence, effectiveness and combined effect for 1975 are 34, 0.84 and 28, and for 1982 are 58, 0.84 and 48.

Sources: **Prevalence**—estimated from age-specific data. For 1975: I. Gajanayake, 1983, see reference 16; for 1982: see reference 12; and for 1987: see reference 13. **Effectiveness**—estimated from standard rates: pill 0.90, IUD 0.95, sterilization 1.0 and all other methods 0.70 (see: J. Bongaarts and R. Potter, 1983, reference 21); and from method-specific use rates: for 1975, see J. Bongaarts and R. Potter, 1983, reference 21; for 1982, see reference 12; for 1987 and for comparable areas in 1975 and 1982, see reference 13.

sterilization accounting for 48 percent and traditional methods for 34 percent of current use. Comparable figures in 1975 were 31 percent and 41 percent, respectively, and in 1982, 38 percent and 45 percent.

The change in fertility rates during this period, however, is not consistent with the rise in reported contraceptive use. Three-year average birthrates centered on 1975 and 1981 are 27.6 and 27.7, respectively; the corresponding provisional figure for 1986 is 22.8.[15] The total fertility rates (TFRs) for 1975 and 1981, estimated as three-year averages, are 3.8 and 3.4 lifetime births per woman, respectively, close to the respective single-year estimates of 3.5 and 3.7. The five-year average (1982–1987) of 2.8, generated from the DHS, is probably too low, because the survey excluded areas with above-average fertility.

According to the SLFS, women living on Sri Lanka's tea estates had lower levels of fertility than women in the rest of the country, despite lower contraceptive prevalence.[16] They had a TFR of 3.2 and a total marital fertility rate (TMFR) of 5.6 for the period 1970–1975, compared with 3.8 and 7.1, respectively, for the entire population; however, the proportion of currently married estate women who reported using a contraceptive method was only 18 percent, compared with 32 percent among all currently married Sri Lankan women. Indeed, one author has shown not only that the marital fertility of estate women was lower than that of Sri Lankan women overall, but that it was being controlled before the government program had begun.[17]

Between 1975 and 1987, reported current use of a contraceptive method rose from 18 percent to 51 percent on the estates; this was almost entirely the result of an increase in the prevalence of sterilization from 10 percent to 40 percent. Sterilization was the most widely reported contraceptive method in both the SLFS (55 percent of users) and the DHS (78 percent).[18] In contrast, the combined share of traditional methods decreased from 21 to 14 percent. Nevertheless, hardly any change occurred in the level of fertility on the estates: The TFR for the period 1970–1975 was 3.2, and 12 years later, for the period 1982–1987, it was 3.4.[19]

In this article, we discuss why there has been an apparent discrepancy between contraceptive prevalence and levels of fertility in Sri Lanka in the last decade and a half; we argue that the underreporting of traditional methods in the earlier surveys is the major reason. In doing so, we draw on the vital registration system, census data, findings from the SLFS (1975), the CPS (1982), the Sri Lanka Contraceptive Survey (1985), the DHS (1987) and the Sri Lanka Demographic Change Project (1985, 1987) and focus on the tea estates and on the country as a whole.

Contraceptive Use and Fertility

Between 1975 and 1982, reported contraceptive prevalence in Sri Lanka increased by about 70 percent, but overall use effectiveness (calculated as the sum of the products of the standard effectiveness of each specific method and the proportion of users relying on that method) changed little. Between 1982 and 1987, both prevalence and effectiveness showed a modest increase (Table 1). The stagnation in contraceptive effectiveness between the SLFS and the CPS was largely the combined result of a sharp drop in IUD use, which reduced the method share from 14 percent to five percent, and a sharp rise in sterilization.[20] Together, changes in prevalence and effectiveness should have had an impact on fertility that was greater between 1975 and 1982 than in the five years that followed, largely because of the rise in prevalence.

A high degree of correlation exists between contraceptive prevalence and fertility levels. This correlation has been expressed in terms of linear regression equations in which the crude birthrate, the TFR or the TMFR is the fertility variable.[21] To avoid any confounding effects of population structure on fertility, we use only the equations that link prevalence to the TFR or the TMFR[22] to predict fertility levels from given prevalence levels.* We then compare these with the fertility levels estimated from birth history data in the surveys (Table 2).

The fertility levels estimated from reported contraceptive prevalence are close to the direct estimates except for the 1974 TFR. Given the levels of contraceptive use reported in the SLFS, we would expect a TFR of at least five children per woman, but the average was actually only four. This suggests that either the observed TFR or the reported contraceptive prevalence is too low. The TFR is not underestimated because it is close to 3.76 and 3.81, the estimates derived from the registration system for 1974 and 1975, respectively, and to other indirect estimates.† We conclude that contraceptive prevalence must have been substantially underreported in the SLFS.

We also note that the other predicted TFRs tend to be higher than the observed rates, although the differences are small, suggesting that any underestimation in the two later surveys would have been less than in the SLFS. Moreover, between 1974 and 1981, the actual TFR hardly changed—it even showed signs of an increase—while the reported prevalence levels predicted that the TFR would decline by about 1.5 children. This suggests that the higher prevalence reported in the CPS includes some actual contraceptive use that was not reported in the SLFS. The marital fertility levels estimated by employing John Bongaarts's equation are close to, but tend to be higher than, the direct estimates from birth histories. Again, the two estimates for 1974 differ most. Ian Diamond's equation, which has more predictive power, also suggested, for 1975, a TMFR that was higher than the actual, while predicting lower values for the two later years.‡ Again, the actual fertility decline between

*One set of estimates is derived from the equation TFR = 7.2 - 6.4U, (R^2=.72), and TMFR = 9.5 - 4.8U, (R^2=.40), where U is the given prevalence level. The TFR and the TMFR are based on data from 22 developing countries, excluding Korea. (See: J. Bongaarts and R. G. Potter, 1983, reference 21.) A second estimate of the TMFR uses the equation TMFR = 10.2 - .082U, (R^2=.71), based on developing and developed countries, for its better predictive power. (See: I. Diamond, 1989, reference 22.)

†The estimate based on the Own-Children Method for the period 1971–1975 is 3.9, and the estimate based on Rele's method for the period 1972–1976 is 3.7. (See: ESCAP, 1986, reference 2.)

‡The variant of the equation (see: I. Diamond, 1989, reference 22) that includes SLFS data from developed, as well as developing, countries explains 66 percent of the variation in TFR and yields the following marginally lower predicted values: 5.04, 3.43 and 2.94 for 1974, 1981 and 1987, respectively. The predicted TMFR values are also lower in comparison with Bongaarts's estimates. The most likely reason for this discrepancy is the inclusion in Diamond's regression of developed countries, where contraceptives are mostly modern and use-effectiveness is higher than in developing countries.

successive surveys remains less than what reported prevalence would predict. Relatively low reporting of contraceptive use in the SLFS, compared with the CPS, could explain why the change in fertility actually observed between the respective years is small when compared with the expected change. This reasoning probably also explains why the actual change in the TMFR between the 1982 CPS and the 1987 DHS is smaller than the predicted change.

On the basis of the same empirical relationships, we estimate prevalence levels compatible with fertility rates derived from the vital registration system (Table 3—page 100). Comparison of these estimates with those reported in Table 1 for the surveys indicates that at the time of the SLFS, prevalence might have been higher by 10–20 percentage points, and that underreporting was most serious in the SLFS. The differential reporting of contraceptive use in successive surveys certainly is partly responsible for discrepancies between fertility and contraceptive use trends.

In addition, the level of use of traditional contraceptive methods detected in the Family Health Impact Surveys of 1971 and 1977—24 percent and 22 percent, respectively—is close to the CPS estimate of 25 percent, but is significantly higher than the SLFS figure of 13 percent, suggesting that the SLFS had markedly underestimated use of fertility control.[23] This further strengthens the argument that the apparent increase in contraceptive prevalence between 1975 and 1982 is an overstatement caused by more serious underestimation of contraceptive prevalence in the SLFS than in the CPS. Apart from errors associated with the estimation procedures, this underestimation would make the actual fertility levels seem low in comparison with those predicted by reported contraceptive prevalence.

On the estates, average use-effectiveness rose from 16 percent to 48 percent between the SLFS and the DHS as large numbers of women who had used IUDs or traditional methods switched to sterilization. If estate fertility was predicted on the basis of reported contraceptive use, employing Bongaarts's equation, the TFRs for 1975 and 1987 would have been 6.1 and 4.0, respectively; the TMFR for 1975 would have been 8.6. These figures are well above the actual rates, which were 3.2, 3.4 and 5.6, respectively. All the predicted values are too high, but the disparity is greatest for 1975. Defying the predicted lowering of the TFR by two children in the period between the SLFS and the DHS, actual fertility showed no signs of decline. These observations are strikingly similar to those made about the entire country. In the estates, too, reported use of contraceptive methods was clearly too low, and there was more underreporting in the SLFS than in the DHS.

Table 2. Predicted and actual TFR and TMFR, 1974, 1981, 1987

Year	TFR		TMFR		
	Predicted	Actual	Predicted from Bongaarts's equation	Diamond's equation	Actual
1974 (SLFS)*	5.24	3.53	7.95	7.58	7.02
1981 (CPS)*	3.77	3.71	6.83	5.69	6.34
1987 (DHS)	3.32	2.82†	6.50	5.12	6.29‡

*The "actual" values are direct estimates calculated from birth histories reported in specific surveys. Thus, the year of the calculation may precede the year of the survey.

†Based on DHS data for the five years preceding the survey.

‡Based on the above rates and the average of proportions married in 1981 and 1987.

Sources: **TFR and 1987 TMFR**—see reference 13. **TMFR for 1974 and 1981**—see reference 20.

Unreported Fertility Control

The above review poses another, more general, question: Do conventional demographic surveys capture all behavior that controls marital fertility? There is ample evidence that, in Sri Lanka, reports of contraceptive use in such surveys understate actual fertility control behavior.[24] Further, estimates based on birth history data (Table 3) yield fairly high expected prevalence levels of 31–35 percent for 1963 and 39–50 percent for 1971; the latter is, in fact, higher than the SLFS estimate of 32 percent. That fertility control is not a recent phenomenon is also evident from our survey of women aged 60 or older: Of the 55 respondents who gave a firm answer to the question "Did people try to prevent births in former times?" 73 percent said yes.* All except two mentioned rhythm, abstinence, withdrawal or some combination of these methods.

Analysis of the fertility of never-users of contraceptive methods, based on SLFS data, revealed that their fertility was under voluntary control.[25] Never-users' fertility showed a significant departure from the standard natural fertility schedule formulated by Ansley Coale and James Trussell,[26] yielding "m" values† of 0.96 and 0.66, respectively, for the most recent periods of 12 months and 60 months prior to the survey. The marital fertility of never-users in the 35–39 age-group varied between 25 percent and 37 percent of the level in the 20–24 age-group, very low in comparison both with 68 percent for the Coale and Trussell natural fertility population and with 56 percent for the average of five non-European populations of never-users compiled by Henri Leridon.[27] The duration ratios (DRATs),[28] which would be more or less constant with age in the absence of fertility control, showed a monotonic decline from 0.79 for the 20–24 age-group to 0.60 for the 40–44 age-group,[29] and, with a mean of 0.67, indicated that their level of fertility was little more than two-thirds of the natural standard.‡ On average, never-users aged 45 or more had ceased childbearing by age 35 (about two years earlier than ever-users), at a marriage duration of 16.5 years.[30] Estate never-users also demonstrated a high degree of fertility control (m=0.83) and a low level of natural fertility (DRAT=0.59) equivalent to about 60 percent of what could be expected according to the age pattern of natural fertility embodied in the Coale and Trussell standard.[31] The Sri Lankan data could have been affected by infecundity and subfecundity, but this would also be true of all the data used for comparison, and there is no evidence of fecundity being markedly lower in Sri Lanka.

The Sri Lanka Contraceptive Survey

Recognizing the need for more reliable measurement of contraceptive use, particularly that of traditional methods, the Department of Census and Statistics, in collaboration with Family Health International, launched a two-phase study called the Sri Lanka Contraceptive Survey

*This finding is from the first stage (1985) of the Sri Lankan Demographic Change Project, carried out jointly by the Department of Demography, Research School of Social Sciences, Australian National University, and the Demographic Training and Research Unit, University of Colombo, Sri Lanka.

†The index "m" describes the degree of fertility control in a population by comparing the fertility of women aged 30–39 with that of Hutterite women, the archetypal population with no control of fertility.

‡DRAT is a measure of fertility relative to the Coale and Trussell standard natural fertility schedule. DRAT is computed for each individual as the ratio of the actual lifetime parity to the expected. If the data are free of gross omissions and fertility follows the age pattern of the standard, DRAT will be more or less constant, whatever the age. Its decline indicates departure from the natural regime of fertility.

Table 3. TFRs and TMFRs from birth registration data and corresponding estimates of contraceptive prevalence rates (CPR), by year

Year	TFR*	CPR†	TMFR	CPR‡
1963	5.04	35	8.02	31
1971	4.12	50	7.62	39
1975	3.78	55	7.28§	46
1981	3.40	61	6.91	53

*Three-year averages centered on the stated year.

†Based on the equation TFR=7.3–6.4u; see reference 20.

‡Based on the equation TMFR=9.5–4.8u (see reference 20). Estimates of prevalence derived from Diamond's equation are lower, viz. 26, 31, 36 and 40 percent for 1963, 1971, 1975 and 1981, respectively (see reference 22).

§Based on the average age-specific fertility rates for 1974, 1975 and 1976, and the average age-specific proportions married in 1971 and 1981.

Sources: **Registration data**—1963, 1971 and 1981, see ESCAP, 1986, reference 2; 1975, see Department of Registrar-General, *Bulletin of Vital Statistics 1980*, Ministry of Home Affairs, Colombo, 1983.

(SLCS). The first phase, which was carried out in 1984, used an anthropological approach, including local residence, participant observation and discussion. Those findings were used to determine the best survey technique for the second phase, a follow-up survey of a sample of 1982 CPS respondents and a subsample of their husbands. In the second phase, special modules were used to obtain detailed information on each method used to delay or prevent pregnancy.[32]

The exploratory study collected data from 200 respondents living in urban, rural and estate areas, and from the major ethnic groups. Analysis of these data showed that reported current method use in 1984 was more than one-third higher than the CPS estimate of 55 percent in 1982.[33] It also found that the respondents' descriptions of rhythm use tended to be so confusing that the interviewers believed the method was not used or was used so poorly that it was ineffective; therefore, they discounted the responses. But although the majority of the respondents underestimated the safe period, they used the method effectively. Likewise, those who used withdrawal only during the unsafe periods were likely to be omitted. This study helped establish what researchers had long believed was the main reason leading to underestimation of contraceptive practice: Modern methods could be discussed openly, but traditional methods, which were described as practices or habits rather than as methods of contraception, could not.[34]

The insights gained in the exploratory study were used in collecting data from 2,310 respondents (1,733 women and a subsample of 577 husbands) in the second phase of the SLCS; as a result, reported ever-use increased by more than two-thirds, from 51 percent without probing to 86 percent with probing.[35] The gain in ever-use resulting from probing was much greater for traditional methods (from 26 percent to 63 percent) than for modern methods (from 42 percent to 53 percent). The SLCS also found a higher overall current-use rate than had the CPS three years earlier (69 percent vs. 62 percent), but the level of traditional method use was the same (Table 4). If traditional methods had continued unchanged, the techniques used in the SLCS would have yielded a higher prevalence for these methods than the CPS had found in 1982, and traditional method share among current users would not have shown a decline from 42 percent to 38 percent.

Nearly all the reported increase in prevalence is for sterilization; because respondents find it easier to discuss modern methods, this probably is an actual increase in use rather than an increase in reporting of use resulting from the new approach adopted in the SLCS. This suggests that as users of traditional methods switch to sterilization, they may be less reluctant to report use of the new method, and that reported contraceptive prevalence may therefore become more accurate. The SLCS revealed that among women whose penultimate method was traditional, 45 percent switched to sterilization, and of those who started fertility control with a traditional method, 29 percent eventually switched to sterilization.[36]

Sterilization drew its acceptors, in almost equal proportions, from women who used traditional methods and from those who used no method.[37] Two factors that may have contributed to this pattern are that respondents in the CPS had been married for at least three years and that the majority had already achieved their desired family size.[38] However, it is logical to extrapolate this pattern of method switching to the period between 1975 and 1982, given that increased payment to sterilization acceptors was followed by large increases in its acceptance. Subsequent acceptance of sterilization by women relying on traditional methods (who may not have been counted as users in the SLFS) would explain, at least partly, the higher contraceptive prevalence reported in the 1982 CPS, which employed survey techniques very similar to those used in the 1975 SLFS.

However, the questionnaires used in the two surveys were not identical. The CPS did not list abstinence as a separate method and recorded its use only if respondents mentioned it spontaneously, whereas the SLFS included it in the list of methods to be read to the respondent; nevertheless, the CPS reported higher use of abstinence. Another difference was that the CPS defined "current use" as use at any time during the month prior to the survey, while the SLFS defined it as use at the time of the survey.[39] It is possible that this variation accounts for part of the increase in reported contraceptive prevalence between 1975 and 1982.

Understatement of traditional method use is also attributed to multiple method use.[40] There is evidence that multiple method use existed at the time of the CPS, with two-thirds of those who used multiple methods relying on rhythm and withdrawal, and most of the others using a traditional method along with condoms.[41] Multiple use probably existed at the time of the SLFS as well. Neither the CPS nor the SLFS was designed to report multiple use; they merely recorded the methods each respondent found easiest to report. Both surveys, therefore, must have underestimated traditional method use.

According to the 1985 SLCS, 9.4 percent of currently married women were using more than one method, with 7.4 percent relying on rhythm with withdrawal, and two percent using one of those methods along with condoms.[42] Given that women are more reticent about traditional methods and "male methods" such as condoms,[43] much of this use could have been missed in surveys such as the SLFS and the CPS, which collected data only from women. Data on current contraception, collected from the husbands in the 1985 SLCS, showed that women tend to report lower use than do their husbands, particularly of the condom, rhythm, withdrawal and abstinence.[44] The overall contraceptive prevalence reported by the wives was 71 percent; prevalence reported by the husbands was 81 percent. On this basis alone, the SLFS and the CPS may have underestimated contraceptive prevalence by at least 10 percentage points.

Clearly, the research instruments and interview techniques employed in the SLFS and the CPS could have resulted in substantial underestimation of contraceptive prevalence, mainly by undercounting users of traditional methods. Therefore, underestimation in the CPS was probably lower than in the SLFS to the extent that women who used traditional methods in 1975 had accepted sterilization by 1982. Widening the reference period to one

month preceding the survey also probably helped to increase reported prevalence in the CPS. The contraceptive use rate calculated from the CPS data, therefore, is less of an underestimate than the corresponding SLFS figure; nevertheless, neither survey captured contraceptive use in full.

The second phase of the 1985 SLCS collected no data on the estate population; therefore, we cannot assess the effect of survey techniques and instruments on reported contraceptive use. Still, some insights were gained during the exploratory phase of the survey. There were many more refusals to discuss contraceptive use on the estates than elsewhere, and much of the respondents' reticence was caused by the inability of the interviewers to gain their confidence.[45] Another reason for the underreporting of contraceptive behavior may be that marital sexual abstinence appeared to be far more common on the estates than elsewhere, and was regarded as normal.[46] Respondents also reported a higher level of abstinence during a famine that preceded the 1975 SLFS and was particularly acute on the estates.

The Demographic Change Project

More intensive field methods were employed in the 1985 Sri Lanka Demographic Change Project in an effort to solve the problem of the understatement of fertility control. In our research in eight lowland sites in the southwest, we first asked couples one question about fertility control. Later in the interview, we questioned the couples about the use of a method, after a repetitive series of questions and explanations that established beyond doubt that they completely understood what the method was. This also ensured that by the time the interviewers asked about method use, they had no hesitation about employing the necessary language and descriptions. When we used this two-stage procedure, the proportion stating that they had used fertility control rose from 55 percent in the first stage to 65 percent after the more exhaustive questions. The greatest increases were in the use of rhythm and abstinence. The extent to which these methods were used became clearer when we probed into each interbirth interval that exceeded three years. Of 1,391 such intervals, 26 percent were achieved with rhythm only, seven percent with withdrawal (alone or in combination with other traditional methods) and 13 percent with abstinence or infrequent sex; another 16 percent were reported to have occurred naturally.* It is quite possible that the last category includes unreported low coital frequency.

Table 4. Percentage contraceptive prevalence and method share, by survey, according to method

Survey	Total	Pill	IUD	Condom	Other modern	Sterilization	Traditional*
1982 CPS							
Prevalence	54.9	2.6	2.5	3.2	1.4	20.7	24.5
Method share	100.0	4.7	5.0	5.7	1.7	38.0	45.0
1982 CPS†							
Prevalence	61.6	2.8	3.5	3.2	1.2	24.8	26.1
Method share	100.0	4.5	5.7	5.2	1.9	40.3	42.4
1985 SLCS							
Prevalence	69.0	2.8	2.6	1.9	1.1	34.5	26.1
Method share	100.0	4.0	3.8	2.7	1.6	50.0	37.8
1987 DHS							
Prevalence	61.7	4.1	2.1	1.9	2.8	29.8	21.1
Method share	100.0	6.6	3.4	3.1	4.4	48.3	34.2

*Rhythm, withdrawal and abstinence practiced singly or in combination, including the 2.0 percent who were using condoms along with rhythm or withdrawal.

†Figures are for currently married women 18–49 who were married for three years or more and living in the 17 districts covered in the 1985 SLCS.

Sources: For 1982 and 1985, see reference 14; for 1987, see reference 13.

In our 1987 research on a tea estate, the use of the two-stage procedure resulted in an increase in reported prevalence from 55 percent to 61 percent. The increase was probably smaller than in 1985 because the interviewers were more experienced and asked the first round of questions with greater precision, clarity and self-confidence. The result was unusually detailed information about the estate population's methods of fertility control. This shed light on the relatively low levels of fertility among the estate women, who had low levels of education but very high levels of employment. The main methods of fertility control previously underreported were infrequent sexual relations, with a prevalence of almost 30 percent for women over 30, and permanent sexual abstinence, rising from 15 percent among women aged 30–39 to 35 percent among those aged 40–49.

A few respondents explained these high levels by saying that the wife's income as a tea plucker—half the family income and often the sole grounds on which the family's housing was retained—would be endangered if she were to be physically weakened by too many pregnancies. Of 125 interbirth intervals exceeding three years, 16 percent were reportedly achieved by infrequent sex, six percent by sexual abstinence and eight percent by rhythm, while 34 percent were said to be natural. Breastfeeding was said to account for only one percent and abortion for less than one percent. Christopher Langford argued that estate women probably used induced abortion to control their fertility,[47] but our research on estate women provided strong evidence that their low fertility resulted from low coital frequency and sexual abstinence, not from induced abortion.

Conclusion

In 1975, the actual fertility level in Sri Lanka was well below what might have been predicted on the basis of contraceptive prevalence, because of substantial underreporting of contraceptive use, particularly of traditional methods, in the SLFS. In the late 1970s and early 1980s, large numbers of traditional method users accepted sterilization as the result of extensive promotional campaigns and the inducement of compensation payments. Among them were many who, through reluctance to discuss private aspects of their lives, had given the impression that they were doing nothing to space or limit their families; however, they had no difficulty in reporting acceptance of sterilization. As a result, contraceptive use rates increased substantially, but fertility did not decrease accordingly.

The discrepancy between Sri Lanka's low fertility and its low reported level of fertility control can be accounted for by a high level of rhythm, some withdrawal and substantial practice of abstinence and low coital frequency. The high prevalence of rhythm in Sri Lanka appears to be unusual in Asia. In many ways, Sri Lanka resembles continental Europe in its fertility transition, probably because of the level of income and the level of education already

*Breastfeeding, spousal separation and abortion account for 2.9, 5.6 and 1.0 percent of the intervals, respectively.

attained there between World War I and World War II. During that period, nuns taught the rhythm method to Sri Lanka's Roman Catholic minority. The use of rhythm spread to the Buddhist and Tamil communities, where its emphasis on self-restraint appealed to fundamental Buddhist and Hindu concepts.

Because this community, unlike southern Europe, had no religious proscriptions against withdrawal, there was a growing tendency to employ that method during the unsafe segment of the menstrual cycle. It was this double use that seems to have caused confusion when interviewers sought information about methods of contraception. Fertility trends in the 1930s suggested fertility control, but the possibility was discounted because contraceptive sales were minimal.[48] The explanation was undoubtedly the use of rhythm and withdrawal, because information about those methods was accessible to the literate through family planning manuals in the indigenous languages of both the major communities. Rhythm appears to have been used remarkably effectively, largely because it was not understood that there was a safe period early in the monthly cycle; therefore, all sexual relations were compressed into a few very safe days at the end of the cycle.[49]

The estate women, with their low reported levels of contraceptive use and low fertility, posed an even greater problem to demographers. It is clear now that the low fertility of these women was largely the result not of induced abortion, but of low coital frequency and terminal sexual abstinence, used because of an unusual economic situation.

The case of Sri Lanka underscores the importance of sensitivity to cultural norms and their use in the field, as well as the need to adapt survey techniques and instruments to suit the particular field study in question.

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Resumen

La tasa de uso anticonceptivo encontrado en la Encuesta de Fecundidad de Sri Lanka (EFSL) de 1975 fue inferior al que se hubiera esperado, teniendo en cuenta el bajo nivel de fecundidad en el país. Encuestas posteriores, como la Encuesta de Prevalencia de Uso Anticonceptivo de 1982 y la Encuesta Demográfica y de Salud de 1987, acusaron un aumento en la tendencia de uso de anticonceptivos, con poca variación en la tasa de fecundidad. En las tres encuestas, las tasas de fecundidad esperadas en base al uso declarado de anticonceptivos eran más elevadas que la tasa verdadera, pero la mayor disparidad se acusó en 1975.

La disparidad aparente entre la fecundidad y el uso de anticonceptivos se explica por una

(Continued on page 111)

The Relationship Between Fertility And Contraceptive Prevalence in Zimbabwe

In Zimbabwe, the total fertility rate is greater than would be expected given the contraceptive prevalence rate; this discrepancy is caused in part by the degree of overlap between contraceptive use and postpartum amenorrhea.

By Donald J. Adamchak and Michael T. Mbizvo

Summary

In 1984, the total fertility rate (TFR) in Zimbabwe was 6.5 lifetime births and the contraceptive prevalence rate was 38 percent among married women aged 15–49; in 1988, the TFR dropped to 5.7 and contraceptive prevalence rose to 43 percent. Estimates of the contraceptive prevalence rates expected to be associated with these TFRs, however, are 12 percent for 1984 and 23 percent for 1988. An extensive overlap is shown between postpartum amenorrhea and early adoption of contraceptive practice: In 1988, 29 percent of total contraceptive use after the last birth overlapped with postpartum amenorrhea. Consequently, the nonoverlapping contraceptive prevalence rate for that year is calculated to be 31 percent. Overlap with postpartum amenorrhea, therefore, accounts for nearly half the difference between the expected and observed contraceptive prevalence rate in Zimbabwe.

Introduction

Zimbabwe has one of the highest reported contraceptive prevalence rates in Africa. The 1984 Zimbabwe Reproductive Health Survey (ZRHS) found that 38 percent of married women aged 15–49 were currently practicing contraception; 27 percent were using modern methods and 11 percent, traditional methods.[1] According to the 1988 Zimbabwe Demographic Health Survey (ZDHS), contraceptive prevalence had increased to 43 percent of married women aged 15–49, with 36 percent using modern methods and seven percent, traditional methods.[2] Similarly, findings from the 1988 Zimbabwe Male Fertility Survey (ZMFS) indicate a contraceptive prevalence rate of 45 percent, with modern methods accounting for 38 percent of use and traditional methods, seven percent.[3]

The corresponding total fertility rates (TFRs) for each of the three surveys were 6.5, 5.7 and 6.1, respectively; these are far in excess of the expected rates, given the high observed levels of contraceptive prevalence. According to the model designed by W. Parker Mauldi and Sheldon Segal,[4] the resulting TFRs should be approximately 4.6, 4.3 and 4.1, given the observed contraceptive prevalence rates of 38, 43 and 45 percent, respectively. Conversely, Mauldin and Segal estimated that the observed TFRs of 6.5, 6.1 and 5.7 should correspond to prevalence rates of approximately 12, 18 and 23 percent. The question, therefore, is: Why does Zimbabwe have high levels of contraceptive prevalence *and* high fertility?

Several researchers have examined this TFR–contraceptive prevalence inconsistency. Ann Way and her colleagues concluded that in the absence of trend data on the proximate determinants of fertility, one can only speculate why fertility rates in Zimbabwe are as high as those recorded in the ZRHS.[5] Esther Boohene and Thomas Dow indicated that modern contraceptive methods are used in Zimbabwe primarily for spacing, rather than for limiting, births.[6] Furthermore, they hypothesized that there could be an extensive overlap between contraceptive use and postpartum amenorrhea because of a relatively long period of breastfeeding and the adoption of a modern method soon after the birth of a child. In this article, we attempt to explain the TFR–contraceptive prevalence inconsistency by empirically testing the hypothesis offered by Boohene and Dow.

Methodology and Sample

We calculated the TFRs and contraceptive prevalence rates from data collected in the 1984 ZRHS, the 1988 ZDHS and the 1988 ZMFS. The expected contraceptive prevalence rates were interpolated from Mauldin and Segal's model of the relationship between the TFR and contraceptive prevalence at the country level. The data used to test this relationship come from the 1988 ZDHS and the 1988 ZMFS.

Our survey of contraceptive attitudes and behavior among males, the 1988 ZMFS, asked each respondent which method his wife had used after her last birth, how soon after childbirth the method was adopted and the duration of use. Since Boohene and Dow suggested that women could have been doubly protected from pregnancy through the overlapping of contraceptive use and postpartum amenorrhea, we included the above items in our questionnaire to determine the extent of an overlap and thus to distinguish between the observed level of contraceptive protection and the nonoverlapping level of protection.

The ZMFS employed a stratified cluster sampling design with proportional distribution of households. Zimbabwe is composed of eight provinces, with each province containing three main administrative areas—urban and semiurban areas (32 percent of households), communal farming areas (50 percent) and commercial farming areas (18 percent). These three broad administrative areas reflect the sustenance organization and economic activities in Zimbabwe.

For survey purposes, the administrative areas had been divided into 4,068 enumeration areas by the Zimbabwe Central Statistical Office, which conducted an in-

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Table 1. Selected measures of fertility and contraceptive use, by survey, Zimbabwe, 1984–1988

Measure	1984 ZRHS	1988 ZDHS	1988 ZMFS
TFR*			
Women aged 15–44	6.47	5.53	5.78
Women aged 15–49	6.52	5.70	6.10
No. of children ever born			
Women aged 15–49	3.9	4.1	4.1
Women aged 40–49	7.3	7.0	7.5
Prevalence rate†			
Total	38.4	43.1	45.4‡
Modern methods	26.6	36.1	38.0
Pill	22.6	31.0	33.4
Condom	0.7	1.2	2.7
Injection	0.8	0.3	0.1
IUD	0.7	1.1	1.0
Vaginals	0.1	0.0	0.0
Female sterilization	1.6	2.3	0.8
Male sterilization	0.1	0.2	0.0
Traditional methods	11.8	7.0	7.4‡
Abstinence	2.1	0.3	8.1
Rhythm	0.6	0.0	3.5
Withdrawal	6.5	5.1	4.3
Other	2.6	1.5	0.5
% ever used			
Any method	65.7	79.0	76.8
Modern method	46.7	63.0	55.6
Traditional method	43.7	48.1	60.8

*For the ZRHS and the ZMFS, currently married women and married women (as reported by their husbands), respectively, calculated 0–12 months prior to the surveys; for the ZDHS, currently married women calculated 0–4 years prior to the survey.

†For the ZRHS and the ZDHS, currently married women aged 15–49; for the ZMFS, all currently married men with one wife and no other sex partners during the year prior to the survey. This was done in order to avoid overreporting current use and ever-use.

‡Adjusted to account for differences in definition of methods between surveys. See footnote on page 104.

tercensal demographic survey in 1987 using 273 representative enumeration areas. We chose a subsample of 11, and obtained the household master file lists (names and addresses) for each. We then systematically sampled each enumeration area type (four communal, three commercial and four urban) with household proportions based on a total of 700 respondents. The sampling frame resulted in 711 respondents. However, in this analysis we use only respondents whose wives were younger than 50. In addition, respondents who reported more than one wife during the year prior to the survey were excluded from the sample. (Just five percent of the sample had two or more wives.) Thus, the final sample size for this analysis is 435.

The sample is representative of the Shona-speaking population, which makes up 80 percent of the population of Zimbabwe. Field work was conducted from April through June 1988. Although the sample is representative of the economic and administrative areas in Zimbabwe, it is nevertheless biased toward the older age-groups. Rural areas, particularly the communal farming areas, are disproportionately over-represented by older men because of the extensive age-selective labor migration to urban areas. To correct for this biased age distribution, we weighted the sample by five-year age-groups based on the arithmetic mean of the 1985 and 1990 United Nations population projections for Zimbabwe.[7]

Table 1 compares the three survey samples on a number of fertility-related characteristics. The TFRs declined over the four-year period between surveys, and although the TFRs reported in the ZMFS are higher than those found in the ZDHS, the difference is not statistically significant. The number of children ever born was 4.1 among all women aged 15–49 in both 1988 surveys and 7.0 and 7.5 for women aged 40–49 in the 1988 ZDHS and the 1988 ZMFS, respectively.

The level of contraceptive prevalence increased over the four-year period between the surveys. The rise in prevalence from 1984 to 1988 was the result of a substantial increase in the use of modern methods, particularly the pill. The rates reported in the two later surveys were nearly identical—45 percent in the ZMFS and 43 percent in the ZDHS—after we adjusted for differences in the definition of traditional methods.* Ever-use of contraceptives was also similar, with 79 percent of women in the ZDHS reporting that they had ever used a method and 77 percent of the men in the ZMFS saying their wives had done so. Based on these sample comparisons, the surveys yield similar information, suggesting that men can be reliable sources of fertility and family planning information in Zimbabwe.

*Although the ZDHS and the ZMFS found similar levels of modern contraceptive use, there is a marked difference in the current use of traditional methods—seven percent vs. 16 percent, respectively. This is because of the definitions of abstinence and rhythm used. In the ZDHS, periodic abstinence/rhythm was defined as avoiding "having intercourse on certain days of the month when the woman is more likely to become pregnant." Postpartum abstinence was not included as a method. However, data on it were collected in the health and breastfeeding module of the survey, indicating that the median duration of postpartum abstinence was 4.3 months and that nearly 60 percent of mothers whose babies were aged 2–3 months had not yet resumed intercourse. Given the different definitions of rhythm/abstinence and the relative consistency between the reported levels of current modern use and withdrawal, we adjusted the proportion of traditional method use in the ZMFS to reflect that found in the ZDHS (that is, the percentage using traditional methods divided by the percentage using modern methods).

Table 2. Percentage distribution of respondents, by family planning method used after last birth and timing of method use, ZMFS, 1988

Method and timing (N=435)	%
Method used	
Pill	64.3
Condom	4.4
Injection	0.5
IUD	1.4
Female sterilization	0.9
Vaginal foam	0.0
Diaphragm	0.0
Male sterilization	0.0
Rhythm	1.1
Abstinence	3.7
Withdrawal	6.2
Other	0.2
No use after last birth	9.7
Never used	7.6
Initiation of use (in months after last birth)*	
0–3	37.6
4–6	24.5
7–9	7.4
10–12	3.9
≥13	1.9
Don't know	7.6
No use after last birth	9.5
Never used	7.6
Total	100.0

*N=433 because of missing data for two respondents.

Contraceptive Use and Timing

Table 2 presents data on the contraceptive method used after the most recent birth by the wives of ZMFS respondents. The data are not the same as the contraceptive prevalence rates because only women who had had a child were included and the men were reporting on births that occurred over time. The data suggest widespread use of a contraceptive method after childbirth: Nearly 72 percent of the

Table 3. Percentage distribution of wives, by duration of family planning use after last birth, according to type of use, ZMFS, 1988

Duration in months	Any method (N=433)	Modern method (N=285)	Not currently using (N=29)
0–12	30.7	38.2	27.6
13–24	22.6	31.6	31.0
25–36	9.7	13.3	13.8
37–48	5.5	8.1	10.3
≥49	7.2	8.8	17.2
Don't know	7.2	na	na
No use after last birth	9.5	na	na
Never used	7.6	na	na
Total	100.0	100.0	100.0

Note: na=not applicable; only respondents of known duration of use were included in the modern method and not currently using categories.

male respondents said that their wives had used a modern method, or that they themselves had used condoms, after the birth of their last child. The pill accounted for 90 percent of use of modern methods (i.e., the pill, the condom, the IUD, injections and female sterilization). Additionally, 11 percent indicated that they had used a traditional method (i.e., withdrawal, abstinence, rhythm and other) and 17 percent used no method after the birth of their last child or had never used family planning.

As to the timing of the initiation of use, 62 percent of all women (and 83 percent of women who used a modern method, not shown) began use within six months of giving birth. The average time between childbirth and initiation of contraceptive use was 4.5 months for any method and 4.4 months for a modern method (not shown).

The duration of method use after the most recent birth is shown in Table 3 by type of use. Nearly 45 percent of all women had used a method for more than one year, as did nearly 62 percent of those who used a modern method. The mean duration of use after the last birth was 21.1 months for any method and 21.3 months for a modern method. However, because many women were still practicing contraception at the time of the survey, their stated length of current use would necessarily result in an underestimate of average duration of use, especially since overall contraceptive prevalence is high and the level after the birth of a child is even higher. Therefore, we would expect women who had stopped using a method to have used that method for a longer period than a sample of women that included current users. The number of women who were no longer using a method is small (N=29), but 72 percent had used a method for over one year. The longer mean duration of use among this latter group was 27.6 months, a more accurate estimate of the closed interval of contraceptive use after the last birth. We used this mean to calculate the prevalence of contraceptive use that does not overlap with postpartum amenorrhea. In summary, Tables 2 and 3 strongly indicate that family planning use is widespread, is started relatively soon after childbirth and is used for slightly more than 27 months.

Nonoverlapping Use

The prevalence of breastfeeding is a strong determinant of postpartum amenorrhea. Boohene and Dow stated that the duration of postpartum amenorrhea in Zimbabwe is approximately 14 months, when associated with an average duration of breastfeeding of 21 months.[8] Hilary Page found that typical breastfeeding durations in Sub-Saharan Africa ranged from 18 to 24 months, which translates into a 12-month or slightly longer period of postpartum amenorrhea.[9] In the model developed by John Bongaarts and Robert Potter, the duration of breastfeeding explained 96 percent of the variance in the duration of postpartum amenorrhea, and approximately 60–70 percent of the duration of breastfeeding was determined to be amenorrheic.[10] In addition, findings from the ZDHS indicate that the median duration of breastfeeding is 19.3 months, while the median duration of postpartum amenorrhea is 12.6 months.[11] We used this estimate of postpartum amenorrhea in our assessment of its overlap with contraceptive prevalence.*

Figure 1 (page 106) diagrams the postpartum fertility status of wives of ZMFS respondents who used a family planning method after their last birth.† The mean initiation of use of any method was 4.5 months after childbirth. The next 8.1 months of the estimated 12.6 months of postpartum amenorrhea overlap with contraceptive use. In other words, 19.5 of the 27.6 months of use was nonoverlapping, representing 71 percent of total use. The remaining 29 percent of contraceptive use overlaps with postpartum amenorrhea.

Multiplying the total prevalence rate of 43 percent among women aged 15–49 from the 1988 ZDHS by the proportion of nonoverlapping use yields a prevalence of nonoverlapping use of 31 percent. Similarly, using the ZDHS contraceptive prevalence of 45 percent among women aged 15–44 results in a nonoverlapping prevalence of 32 percent. Finally, using the contraceptive prevalence rate of 45 percent among women aged 15–49 from the ZMFS data yields a nonoverlapping prevalence rate of 32 percent.

Our findings appear to empirically validate the previously untested assertions made by Boohene and Dow that extensive overlap exists between contraceptive use and postpartum amenorrhea, caused by the relatively early adoption of a method after childbirth and by the long and nearly universal period of breastfeeding. Based on our estimate of the proportion of total contraceptive use that is nonoverlapping, we calculated nonoverlapping contraceptive prevalence in Zimbabwe to be 31–32 percent, compared with the observed prevalence rates of 43–45 percent found in the two 1988 surveys (see Table 4).

The table also shows the results of comparing the expected prevalence rates (derived from the TFR using the Mauldin and Segal model) with the observed rates. Thus for a TFR of 6.1, the expected contraceptive prevalence accounts for only 39 percent of the observed prevalence. However, the expected contraceptive prevalence accounts for 55 percent of what we have calculated to be the prevalence of nonoverlapping use. Similarly, for a TFR of 5.5, the expected prevalence rates represent 57 percent of the observed total use and 81

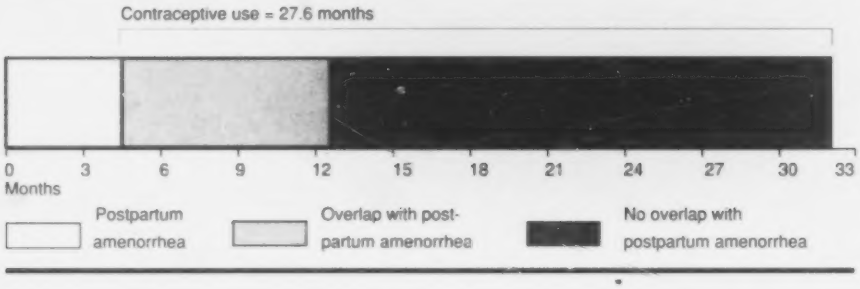
Table 4. Total fertility rates and various contraceptive prevalence rates, by survey and age of women

Survey and age of women	TFR	Contraceptive prevalence rates			Expected divided by observed	Expected divided by nonoverlapping
		Observed	Nonoverlapping	Expected		
ZMFS						
15–49	6.1	45.4	32.1	17.6	38.8	54.8
15–44	5.8	45.4	32.1	21.8	48.0	67.9
ZDHS						
15–49	5.7	43.1	30.5	23.2	53.8	76.1
15–44	5.5	45.3	32.0	26.0	57.4	81.3

*In addition to the contribution of lactational amenorrhea, two other factors can delay ovulation and conception to some degree. First, postpartum amenorrhea among women who do not breastfeed will usually range from 1.5 to three months. However, among women who do breastfeed, this postpartum amenorrheac period overlaps with the lactational amenorrhea period. Second, the cultural practice of postpartum abstinence, which can last up to two or three years in Africa, overlaps significantly with breastfeeding and, therefore, with postpartum amenorrhea. The 1988 ZDHS found that the median duration of postpartum abstinence in Zimbabwe was only 4.3 months. Since breastfeeding is nearly universal and has a median duration of 19.3 months, postpartum abstinence does not appear to have a significant independent effect.

†Figure 1 can be characterized as an aggregate model of the relationship between postpartum amenorrhea and the initiation and duration of contraceptive use. However, we do not know the relationship between contraceptive use (initiation and duration after last birth) and breastfeeding behavior of individual women. It is possible, although unlikely, that women who are using a contraceptive method are breastfeeding for short periods and that nonusers are breastfeeding for very long periods of time.

Figure 1. Contraceptive use since last birth, by month since birth, Zimbabwe, 1988



percent of the nonoverlapping use. Our analysis indicates that the expected contraceptive prevalence is much closer to nonoverlapping prevalence than it is to observed prevalence. The differences between our estimates of nonoverlapping contraceptive prevalence and Mauldin and Segal's estimates of expected prevalence at the given TFRs could be caused by the effects of other proximate determinants of fertility.

Discussion

As long as contraceptive methods are adopted shortly after birth and current breastfeeding patterns continue—meaning that postpartum amenorrhea continues to last approximately 12 months—significant differences between observed and nonoverlapping contraceptive prevalence may exist.

These findings could have important implications for family planning programs in Sub-Saharan Africa and for expectations concerning fertility decline. First, expected fertility declines could be delayed, particularly if birth intervals do not increase. If birth intervals increase, contraceptive use may become more effective in preventing births, since family planning methods may be used for a longer period of time beyond the overlapping of postpartum amenorrhea with the method used. However, an increase does not seem probable, because the 1984 ZRHS found that 42 percent of women reported an ideal birth interval of less than two years and 33 percent reported an interval of two to three years. Results from the 1988 ZMFS indicate that these preferences changed little over the period between the surveys: Forty-five percent of men reported an ideal birth interval of less than two years and 34 percent preferred an interval of two to three years. These findings suggest that contraception is used primarily for spacing, which 53 percent of the total sample and 66 percent of ever-users indicated in the survey. Therefore, a realistic approach to bringing about fertility decline in Zimbabwe would be the implementation of Information, Education and Communication (IEC) programs to promote spacing intervals of more than three years.

Second, if breastfeeding duration, and therefore postpartum amenorrhea, decreases, contraceptive use will become comparatively more efficient. However, fertility could increase at the societal level, since the diffusion of a shortened breastfeeding duration could precede or be more widespread than the adoption of contraceptive practice.

Third, family planning programs and their supporting agencies need to set realistic goals that consider the differences or potential differences between observed and nonoverlapping contraceptive prevalence. Since Zimbabwe has one of the highest contraceptive prevalence rates in Africa, it could be used as a model in understanding the dynamics of this relationship.

Fourth, to assess the magnitude of the postpartum amenorrhea–contraceptive prevalence overlap, we strongly recommend including the variables used in this research in future surveys. These variables are the specific method, if any, used after the last birth; the timing of method adoption after the last birth; and the duration of method use after the last birth.

Finally, the notion of "excess fertility" for a given level of contraceptive prevalence may no longer be suitable in the context of these findings. Rather, a significant proportion of observed contraceptive prevalence appears to be in "excess," as it is far greater than the expected TFR level would indicate because of the redundancy with postpartum amenorrhea. It is essential that family planning program officials know the true extent of overlap to develop realistic fertility estimates and goals for their programs. Understanding the advantages of adopting contraceptive use shortly after birth is also important. A population that is responsive to using family planning for spacing births should eventually adopt family planning for limiting births. The general acceptance of family planning and the early adoption of contraceptive practice soon after birth in Zimbabwe will expedite that process.

Like Zimbabwe, other developing countries with relatively high levels of contraceptive prevalence and fertility may be experiencing considerable overlap between postpartum amenorrhea and contraceptive use. Determining the existence and magnitude of such an overlap could add a new dimension to family planning program design, goals and evaluation.

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Resumen

En 1984, la tasa global de fecundidad (TGF) en Zimbabwe era de 6,5 nacimientos por mujer y la tasa de uso anticonceptivo era de 38 por ciento entre las casadas de 15 a 49 años de edad; en 1988, la TGF bajó a 5,7 y la prevalen-

(Continued on page 111)

Comment

Islam, Procreation and the Law

By Zulie Sachedina

Islam is a faith with over a billion adherents worldwide. Complexity and diversity within this large population, as well as the relationship between Islam and the state, often result in a variety of attitudes and approaches regarding reproductive issues.

In about the year 610 A.D., Muhammad received his first revelation from Allah; this commenced his prophethood and the religion of Islam. Prophet Muhammad conveyed to his fellow citizens a twofold summons—to recognize a sovereign divine power that fashions and controls human destiny, and to commit themselves in constant obedience to following the pattern ordained by the divine will.[1]

The message Muhammad preached to the Arabs came to him through a series of revelations Allah gave him throughout Muhammad's prophethood until the end of his life. The revelations were collected in a book called the Quran, which is the fundamental authority for Muslims in all matters of religious belief and practice and of the law. The Quran is viewed by Muslims as "Kalam Allah," or the very words of God.[2]

Islam is a comprehensive system that regulates the spiritual as well as civic aspects of individual and communal life.[3] However, it has no clergy and no central authority to proclaim the position of the entire Muslim community on any matter, so there has been opportunity for different interpretations of the Scriptures.

The rules and regulations that were revealed to Muhammad are called Shari'ah—a guide or road map to a successful life in the world and to communion with God.[4] The Shari'ah is often described as law, but this term is misleading because the obligations that arise under it frequently fall upon individuals; each person stands in an immediate relationship of accountability with God. Although aspects of the Shari'ah are often incorporated by particular state governments to fashion the laws of the country, Shari'ah itself is more accurately viewed as a detailed code of conduct. To Muslims, Shari'ah is infallible because it is mandated by God, and represents the eternal will of the universe's creator.[5]

The divine Shari'ah is comprehensive and is viewed as offering all the guidance necessary to humankind. Islamic jurists have emphasized the completeness of the Shari'ah, which classifies all human actions without exception into one of five categories: obligatory, recommended, permitted, disapproved but not forbidden, or absolutely forbidden.[6] Even when an action is categorized as forbidden, it may be undertaken if the alternative would do more harm.

The billion Muslims of this world are divided into various sects and schools of thought. In general, however, the Islamic community falls into two great divisions—the Sunnis and the Shi'is. The Shi'is got their name from Ali, the cousin and son-in-law of the Prophet. The claim that "Imamah" (leadership) remained with the Prophet's family has been a cardinal Shiite doctrine throughout history.[7]

At present, there are four major schools of interpretation within the Sunni sect, developed around the interpretations of particular jurists. Each is typically associated with a particular region and all are considered "true Islam." The Maliki school, which follows the interpretations of jurist Malik ibn Annas, is the norm in much of North Africa except in Egypt. The Hanafi school, following jurist Abu Hanifah, prevailed in the Ottoman Empire and in Central Asia and was taken to the Indian subcontinent by the Muslim conquerors. The strictest doctrine is that of the Hanbali school, following the interpretation of Ahmad bin Hanbali, which today is confined to the Arabian peninsula. The Shafi'i school, following the interpretations of Al Shafi'i, prevails in much of the rest of the Islamic world, including Indonesia, Egypt, Syria and East Africa.[8]

The implementation of a code of conduct such as the Shari'ah requires reliable methods of applying its broad principles to specific situations. The need to develop a jurisprudence came from the brevity and potential ambiguity of the revelations in the Quran. For more than two centuries, there was uncertainty about the way in which Muslims might arrive at normative decisions on matters the Quran did not specifically address. Among the Sunnis, there is now a universal acceptance that there are four basic roots of Islamic law, which stand in a definite order of precedence. The first and foremost authority is the Quran—no other authority may supersede a clear Quranic commandment. The second source of norms is the Sunnah, the customary usage of the Prophet, which is known to the Muslims through a series of oral reports called hadiths. To assign appropriate weight to the multitude of hadiths, they are classified as sound, good, or weak, depending on proof of their authenticity. The third source is the ijmaa, or consensus of jurists. This principle is expressed in a saying attributed to the Prophet: "My community will never agree in error." The fourth root of guidance, resorted to when the previous three cannot provide the answer, is qiyass (analogy), which must proceed from a previously established rule and can never overturn or

Zulie Sachedina was a human rights intern with the University of Toronto Law School and the World Health Organization (WHO) at the time this article was written. The article is part of a broader study done under the auspices of the WHO to explore the perspectives of the principal religions regarding procreative matters, in order to help policymakers and providers deliver reproductive health services in a sensitive and compassionate manner. The author would like to thank Jose Barzelatto, Mahmoud Fathalla, Sev Fluss, Maher Mahran, G. R. Dunstan, Sheila A. M. Mclean and Rebecca Cook for their support and suggestions.

supersede judgments based on one of the other roots.[9]

While all Sunni sects accept these basic roots of law, the Shi'is accept only the Quran and the Sunnah, rejecting the doctrines of ijmaa and qiyass. The Shi'is believe that their Imams (leaders) have the sole authority to interpret the Quran and the Sunnah and to determine what the believer shall do. In practice, however, the consensus of the Sunni jurists is treated by the Shi'is as opinion worth considering.[10]

The emphasis on tradition and on the apparent rigidity of the Shari'ah has been a source of criticism in contemporary Muslim society. However, some authors have suggested that the concept of naskh (abrogation, repeal) can give Islamic Shari'ah a dynamic element. All the major schools acknowledge that the Quran contains verses that repeal earlier verses,[11] and that the Sunnah could, and in some cases does, abrogate previous Sunnah. For example, the Prophet is reported to have said: "I have previously forbidden you to visit graveyards, but Muhammad has now been permitted to visit his mother's tomb, so do visit graveyards for they remind you of the hereafter."[12] The ijmaa cannot abrogate a text, but if the consensus is based on public interest, it may be repealed if the public interest so requires.[13] Hence naskh shows that reinterpretation may not be anathema in Islamic law: "If verses of the Quran repealed other verses of the Quran," one author said, "is it really that unthinkable for jurists to contradict earlier jurists?"[14]

Sexuality and Contraception

Nonetheless, current Islamic practice emphasizes tradition and interpretations already established, and it is therefore necessary to look at Islamic attitudes towards sexuality and reproduction from a historical perspective. Within the confines of marriage, sexuality is treated as one of the good things in life that a Muslim should enjoy. Marriage is commendable and is recommended for whoever can afford it. Its purpose is seen as twofold. First, it unites the two elements of humanity; this is reflected in the following verse of the Quran:

> Amongst His signs is that He created consorts (in marriage) for you from amongst yourselves, so that you may find tranquility with them, and (He) set love and compassion between you. Verily, in this are signs for those who reflect. (Quran S. 30:21)[15]

The second purpose, also stated in the Quran, is the procreative function:

> And God has created for you consorts (in marriage) from amongst yourselves, and through your consorts He created children and grandchildren for you, and provided you of His bounty. Will they then believe in vain things and be ungrateful to God's favours?! (Quran S. 16:72)[16]

The Quran does not specifically indicate the relative weight of either the procreative or the unitive aspects of intercourse and does not specifically address the permissibility of contraceptive practice. For that, the Muslim jurists relied on the second source of law, the hadith. Several hadiths of the following companions of the prophet are most often cited in addressing this issue.

According to Jabir, for example, "We used to practice coitus interruptus during the Prophet's lifetime. News of this reached him and he did not forbid us."[17] Also according to Jabir, "A man came to the Prophet and said, 'I have a slave girl, and we need her as a servant and around the palm groves. I have had sex with her, but I am afraid of her becoming pregnant.' The Prophet said, 'Practice coitus interruptus with her if you so wish, for she will receive what has been predestined for her.'"[18]

According to Abu Sa'id, "We rode out with the Prophet to raid Banu al-Mustaliqu and captured some female prisoners . . . We desired women, and abstinence became hard. (But) we wanted to practice coitus interruptus; and we asked the Prophet about it. He said, 'You do not have to hesitate, for God has predestined what is to be created until Judgement day.'"[19] Abu Sa'id also said, "The Jews say that coitus interruptus is minor infanticide, and the Prophet answered, 'The Jews lie, for if God wanted to create something, no one can avert it (or, divert Him).'"[20]

Stated Judhama bint Wahb, "They asked him about coitus interruptus, and the Prophet answered, 'It is hidden infanticide . . .'"[21] Said Umar Ibn al-Khattab, "The Prophet forbade the practice of coitus interruptus with a free woman except with her permission."[22] According to Anas, "A man asked the Prophet about coitus interruptus, and the Prophet said, 'Even if you spill seed from which a child was meant to be born on a rock, God will bring forth from that rock a child.'"[23]

These hadiths were important but not decisive, since they did not give consistent guidance. In the absence of explicitly religious provision, Muslim jurists had to resort to the doctrines of ijmaa and qiyass.

The Shafi'i jurist Ghazali (1058-1111) argued that there was no basis for prohibiting coitus interruptus. He reasoned that pregnancy had four related causes: marriage, intercourse, emission of semen, and allowing semen to reach and settle in the womb. As far as procreation was concerned, abstention from the fourth was like abstention from the third, which was like abstention from the second, which in turn was like abstention from the first. Since the first action was not obligatory, none of the ensuing acts could be obligatory.[24]

The jurist Ibn Hazm (994-1063) argued that coitus interruptus was prohibited because the Prophet had abrogated earlier permissive hadiths when he equated coitus interruptus to infanticide, which is condemned in the strongest terms by the Quran. Another jurist later explained that "the Prophet called coitus interruptus hidden infanticide because it shared with true infanticide the same motive: escape from additional dependents. But true infanticide was not prohibited because of this motive, which in itself was proper, but because it involved murder."[25]

Using the sources of quiyass, Muslim jurists of the major schools were able to reach ijmaa. They agreed that contraceptive practice was proper and classified it as permitted or disapproved but not forbidden. For the jurist Ghazali, health and even economic indicators, as well as a man's desire to ensure the physical appeal of the woman, were considered acceptable reasons for the practice of contraception. However, he disapproved of the use of a contraceptive method to avoid having female children or because the woman wanted to maintain her beauty. Ghazali's position makes it evident that Islam calls into question the motives for contraception, rather than the practice itself.[26]

Initially, the practice of coitus interruptus was only permitted with the consent of the woman. Later, medieval jurists used the reason of "bad times" as unconditional permission for contraceptive practice: "Coitus interruptus is permitted without a free woman's consent because the times are bad."[27] The presence of a nursing child was an acceptable reason for almost all jurists.[28]

So it could be said that contraceptive use has been sanctioned since the hadiths of the Prophet, but, at that time, the focus was on the all-powerful Allah.[29] The economic, personal, social and medical reasons appeared in later reasoning and illustrate the dynamism of the Shari'ah.

In the absence of an explicit religious position, it is not surprising that there were, and continue to be, different view-

points on issues of contraceptive practice. Some scholars argue that the procreative element is the major aspect of marriage, and contraceptive practice is unacceptable. The Quran supports such a position in this verse: "Your wives are a tilth for you, so go into your tilth as you like and do good beforehand for yourselves."(Quran S. 2:223)[30]

"By describing women as a tilth, an important biological fact has been pointed out," writes the scholar Maududi. "Biologically, a man is a tiller and women is tilth and the foremost purpose of the interrelationship between the two is the procreation of the human race. This is an objective which is common to all—human beings, animals and the world of vegetation. The tiller of the soil cultivates the land, not in vain, but for produce. Take away this purpose and the entire pursuit becomes meaningless."[31]

Other scholars argue that the use of a contraceptive method serves to frustrate Allah's will and reflects a lack of faith in the power and benevolence of the Creator; these conservative attitudes continue to exist in some schools of thought. However, the following fatwas (learned opinions) illustrate that temporary contraceptive methods are considered acceptable to most:

> Islam, as the religion of pristine nature, has never been opposed to what is good to man. Indeed, it has always been ahead in the effort towards the achievement of this good so long as it is not in conflict with the purposes of God's Law.
>
> I see no objection from the Shari'ah point of view to the consideration of family planning as a measure, if there is a need for it, and if the consideration is occasioned by the people's own choice and conviction, without constraint or compulsion, in the light of their circumstances, and on the condition that the means for effecting this planning is legitimate. (Fatwa of Shaikh Hasan Ma'mun, Rector of Al-Azhar, 1964)[32]
>
> There is agreement among the exponents of jurisprudence that coitus interruptus, as one of the methods for the prevention of childbearing, is allowed. Doctors of religion inferred from this that it is permissible to take a drug to prevent childbearing, or even to induce abortion. We confidently rule in this *fatwa* that it is permitted to take measures to limit childbearing. (Fatwa of Shaik Abdullah Al-Qalqili, Grand Mufti of Jordan, 1964)[33]

Table 1. Status of abortion and sterilization in six Islamic countries, 1990

Country	Sterilization	Abortion
Bangladesh	Legal; widely promoted method of family planning; requires informed consent	Legal to save woman's life
Egypt	Not prohibited; woman must be age 35 and have 3 children, at least 1male	Legal for genetic and maternal health indications
Iran	Illegal except for medical and eugenic reasons	Legal to save woman's life
Indonesia	Status unclear	Legal to save woman's life
Saudi Arabia	Illegal except for medical and eugenic reasons	Legal to save woman's life
Tunisia	Legal; woman must be age 30 and have 4 children, at least 1of each sex	Legal for all reasons up to 3 months

Sources: **Sterilization**—J. A.Ross, S. Hong and D. H. Huber, *Voluntary Sterilization: An International Fact Book*, Association for Voluntary Sterilization, New York, 1985; United Nations Fund for Population Activities, *Survey of Laws on Fertility Control*, New York, 1979; and World Health Organization (WHO), *International Digest of Health Legislation*, Geneva, 1985–1988. **Abortion**—C. Tietze and S. K. Henshaw, *Induced Abortion: A World Review 1986*, The Alan Guttmacher Institute, New York, 1986; and WHO, *International Digest of Health Legislation*, Geneva, 1986–1988.

The Quran and the hadiths make no reference to sterilization. The issue of permanent sterilization as a method of contraception remains an issue of controversy among Muslim jurists. As one jurist argued, "permanent sterilization was allowed because there was no explicit and definitive text to prohibit it and because the preservation of reproductive power was not one of the obligations under the Islamic law."[34] Some scholars reason that since Islam does not place any time limits on contraceptive practice, and a couple has the right to use a temporary method permanently, they should have the right to adopt a permanent contraceptive method.[35]

Other jurists cite an earlier judgment (viewed as binding), which stated that "it is forbidden to use what stops childbearing altogether; but what slows down or delays childbearing without stopping it altogether is not forbidden, and if it is for a reason such as the bringing up of a child in a proper manner, it is not even disapproved of."[36] Consequently, permanent sterilization is acceptable only if "one of the spouses is suffering from a psychological, sexual or mental disease, proven medically to be inevitably transmissible by heredity, and not capable of being cured by any treatment at all."[37]

The opinion that sterilization is unacceptable as a contraceptive method is held by many jurists from all four major schools within the Sunni sect and by a number of Shi'i sects as well.[38] In the absence of a specific religious prohibition against sterilization, this reluctance to allow sterilization stems from the deep belief that when man frustrates Allah's will, he oversteps his boundaries. However, of the six Islamic countries in Table 1, only two have made sterilization explicitly illegal—Iran and Saudi Arabia. It is allowed in most of the other countries, albeit with restrictions on the woman's age and family size, but it is widely promoted as a method of family planning only in Bangladesh.

Islam and Abortion

The Quran makes clear reference to the progressive development of the fetus:

> O mankind! If you are in doubt as to the Resurrection, [consider] that We have created you of earth; then of semen; then of a blood-like clot; then a lump of flesh, [which is] formed or unformed; so that We may demonstrate to you [our power]; and We establish in the wombs what We will, till a stated term; then We bring you out as infants . . . (Quran S. 22:4)[39]

Fetal development has been viewed by Muslims as occurring in three stages, each lasting 40 days: the semen, the blood-like clot and the lump of flesh. At the end of these stages, Muslims consider the fetus ensouled.[40] All schools within the Muslim community make a distinction between the stages before and after ensoulment. Every school agrees that abortion after the first 120 days is forbidden except to save the mother's life; there is, however, no consensus on abortion before the period of ensoulment. The Zadis (a small Shiite sect), maintain that an unensouled fetus is the same as semen, and abortion is possible unconditionally. Most other schools clearly

distinguish between abortion and contraceptive practice, and most Muslims consider abortion at any stage to be an offense, albeit of different degrees.[41] Ghazali presented this view:

> Contraception is not like abortion. Abortion is a crime against an existing being. Now, existence has stages. The first stages of existence are the setting of the semen in the womb and its mixing with the secretions of the woman. When it develops further and becomes as a lump, aborting it is a greater crime. When it acquires a soul and its creation is completed, the crime becomes more grievous. The crime reaches a maximum seriousness, when it is committed after it is separated alive (from the mother). (al-Qaradawi, 1981, p. 202)[42]

Some contemporary scholars argue that modern science presents different information regarding the "beginning of life" and suggest that the formation of the zygote rather than the "quickening" stage be considered the beginning of life.[43] The concept of ensoulment has perplexed scientists and philosophers throughout the ages. A medieval scholar wrote that the fetus was ensouled after 120 days and adds "this can be known only through revelation, for there is no reason in nature as such which requires it."[44] Another wrote, "Ensoulment belongs to a different realm of meaning, outside science but at the center of religion."[45]

At the International Islamic Conference held in Morocco in 1971, views of the various jurists on abortion before ensoulment were summarized.[46] Permission, without dependence on a reason, was granted by the Zadis, some Hanafis, some Shafi'is, some Malikis and some Hanbalis. Permission depending upon a reason, and disfavor when there was none, was the rule for some Hanafis and some Shafi'is. Abortion before ensoulment was looked upon with disfavor by some Malikis and prohibited by others, and disapproved of by many of the Shi'i sects. Thus, it is virtually impossible to state one Islamic viewpoint on the issue of abortion. Nonetheless, Tunisia is the only Muslim country shown in Table 1 to allow unrestricted first-trimester abortions. Most Muslim countries permit first-trimester abortion only to save the woman's life.

Religion and the State

As one modern scholar explains, "Muslims frequently contrast their religion with Christianity, where a distinction is made between God's realm and Caesar's, by citing the traditional adage, 'al-Islam din wa dawla,' or, Islam is religion and state."[47] Until the late 1960s, many Muslim countries appeared to have embarked on a course of secularization along Western lines. However, this change was not accepted by large segments of the Muslim population, and there has since been a dramatic upsurge in the call for the repudiation of Westernization and a return to Islam. These movements demand, at least, the reinstatement of the Shari'ah as the law of all Islamic lands, and many call for the establishment of an Islamic state.[48]

The church-state relationship in Islamic history has varied enormously according to local circumstances. Rulers acknowledged the great diversity of legal tradition within Islam and rarely tried to impose one version of the Shari'ah. Therefore, Islamic history gives little guidance concerning what the relationship between the state and Islam should be in the modern world. It is impossible to predict, simply by consulting the Shari'ah, what an Islamic state would entail; one must examine the political aspirations of the group calling for its establishment.[49]

Many Muslim countries have constitutional provisions indicating that the Shari'ah is either "a source" or "the source" of legislation. The rules of Shari'ah in areas of personal status have been interpreted particularly strictly because they are set forth in far greater detail in the Quran than the rules in other areas of the Shari'ah, and an assumption is made that these matters are paramount and cannot be tampered with.[50]

"The special attachment to personal status law may also be connected to deeply ingrained traditions of patriarchal family organization," a scholar suggests. "Thus in terms of exercising control over women, the Shari'ah rules of personal status may have assumed more importance now than in the past, when informal social control over women's lives rendered legal sanctions largely superfluous."[51] The issue of the status of women is increasingly pursued on the religious, rather than secular, level. Those opposed to expanding the rights of women cite the Shari'ah as justification, and those sympathetic to women's rights cite Islamic authorities who have spoken of gender equality.[52]

In almost all countries of the world, control over fertility has tended to be the watershed issue as far as the status of women is concerned. Questions about women and their role in contemporary society are invariably at the heart of the debate surrounding procreation, a debate that will continue within the religious context in many Islamic countries. There is no one monolithic view that would summarize the response of Islam to the myriad of issues raised by procreation in the late 20th century. But it is evident that the position of Islam itself is much less rigid than it would appear at first. It should be clear to policymakers that the Shari'ah has always had the flexibility to address contemporary problems. The canons of interpretation of Shari'ah and the concept of naskh (abrogation) illustrate that reinterpretation and change is not untenable in Islam. The Shari'ah provides invaluable guidance but does not shackle policymakers forever.

As the scholar Iqbal said, "The teaching of the Quran that life is a process of progressive creation necessitates that each generation, guided but unhampered by the work of its predecessors, should be permitted to solve its own problems."[53]

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"Fertility and Method Use in Zimbabwe"

(Continued from page 106)

cia del uso aumentó a 43 por ciento. Sin embargo, las tasas esperadas asociadas a dichas TGFs fueran de 12 por ciento para 1984 y 23 por ciento para 1988. Se verificó que la amenorrea postparto coincidía de manera importante con la temprana iniciación del uso de anticonceptivos: en 1988, el 29 por ciento del uso total de anticonceptivos después del último parto coincidía con la amenorrea postparto. En consecuencia, se calculó la prevalencia de uso que no coincidía en 31 por ciento. Así, la amenorrea postparto coincidente con el uso anticonceptivo explica casi la mitad de la diferencia entre las tasas de prevalencia esperadas y observadas en Zimbabwe.

Résumé

En 1984, l'indice synthétique de fécondité au Zimbabwe était de 6,5 naissances et le taux de prévalence contraceptive, de 38 pour cent parmi les femmes mariées âgées de 15 à 49 ans; en 1988, l'indice synthétique de fécondité était tombé à 5,7 tandis que la prévalence contraceptive passait à 43 pour cent. Cependant, les taux de prévalence contraceptive approximatifs attendus en présence de tels indices sont, respectivement, 12 pour cent pour 1984 et 23 pour cent pour 1988. Un chevauchement entre aménorrhée post-partum et adoption précoce de pratiques contraceptives s'est démontré: En 1988 29 pour cent de l'usage contraceptif total après la naissance d'un dernier enfant coïncident avec l'aménorrhée post-partum. Par conséquent, le taux de prévalence contraceptive sans chevauchement pour cette même année était de 31 pour cent. Ainsi, le chevauchement de l'aménorrhée postpartum explique presque la moitié de la différence entre le taux de prévalence contraceptive attendu et observé au Zimbabwe.

"The Puzzle of Sri Lanka"

(Continued from page 102)

importante falta de declaración del uso de métodos tradicionales en la EFSL y declaraciones más completas en encuestas posteriores. Las declaraciones de uso de métodos fueron incompletas debido al hecho de que las usuarias de métodos tradicionales no los ven como métodos de control de la fecundidad. Gran parte del aumento observado en el uso anticonceptivo entre las encuestas se debe al hecho de que las anteriores usuarias de métodos tradicionales que habían sido esterilizadas se demostraron menos reacias a declararlo.

Résumé

Le taux de prévalence contraceptive dont fait état l'Enquête de fécondité de Sri Lanka de 1975 (EFSL) est inférieur à celui auquel on aurait pu s'attendre lorsque l'on considère le faible niveau de fécondité du pays. Des études ultérieures, telles l'Enquête sur la prévalence contraceptive de 1982 et L'Enquête démographique et de santé de 1987, révèlent un taux de prévalence croissant sans que s'en trouve véritablement affecté le niveau de fécondité. Dans ces trois études, les niveaux de fécondité auxquels on aurait pu s'attendre en fonction des prévalences contraceptives signalées se sont avérés plus élevés que les taux effectifs, la divergence la plus marquée ayant toutefois été observée pour 1975.

Cette divergence apparente entre fécondité et contraception s'explique par l'importante sous-estimation dans l'EFSL du recours aux méthodes traditionnelles et par son évaluation plus précise dans les études ultérieures. Cette sous-estimation est principalement due au fait que les méthodes traditionnelles n'étaient pas perçues par leurs utilisateurs en tant que méthodes de contrôle de la fécondité. La reconnaissance du recours à ces méthodes par d'anciens utilisateurs s'étant plus tard fait stériliser et donc plus disposés à admettre ce recours explique en grande partie l'augmentation de la prévalence contraceptive observée d'une étude à l'autre.

DIGEST

Few Women in Burkina Faso Use Contraceptives, But Many Know of and Would Consider Using Them

About two-thirds of sexually active women of reproductive age in Burkina Faso's capital city have heard of a modern method of contraception, although only five percent are currently using one.[1] A survey of women in Ouagadougou revealed that 41 percent of respondents were practicing postpartum abstinence at the time of the survey, but that many did not associate the practice with family planning. The vast majority of women not using a modern method say that they might consider doing so in the future, and 70 percent of the respondents say they hope to delay their next birth or want no more children.

Survey data were collected in Ouagadougou in April and May of 1986 by 10 trained female interviewers. A total of 1,007 women aged 15–49 were selected from a random sample of households in 10 of the 30 sectors of Ouagadougou. Data were analyzed for 759 women who were 15–44 years of age and who were currently married or had a current sexual partner. Fifty-seven percent were in a monogamous marriage, 31 percent were in a polygamous marriage and 12 percent were single. The respondents' mean age was 27.7 years, 65 percent had no education and 61 percent were Muslim; they had had an average of 3.6 children, but only 2.7 were still living. Women 40–44 years of age had borne two more children, on average, than were still living at the time of the survey (7.8 and 5.8 children, respectively).

Sixty-four percent of the respondents said they had heard of one or more modern methods of contraception, although only 34 percent could name such a method without prompting. The best-known modern method was the pill, mentioned without prompting by 31 percent of the women and recognized overall by 60 percent; such methods as injectables and the IUD were rarely mentioned spontaneously (by 12 percent and 10 percent, respectively), although at least two in five Burkinabè women recognized them as methods of family planning (47 percent and 41 percent, respectively). Although 63 percent of the respondents recognized postpartum abstinence as a family planning method and 39 percent recognized periodic abstinence, only tiny proportions (one percent and four percent, respectively) volunteered these methods. According to the investigators, family planning knowledge among these women is primarily "passive recognition."

Single women were significantly more likely than married women to know of a modern method (87 percent, compared with 64 percent of women in monogamous unions and 54 percent of those in polygamous unions). In addition, respondents with a secondary education or more were far more likely to know of a modern method (96 percent) than were those with no formal education (52 percent); Christian women were significantly more likely than Muslim women to know of a method (75 percent vs. 57 percent); and women who grew up in an urban area were more likely than those raised in a rural region to know of one (71 percent vs. 52 percent).

Levels of current contraceptive use in Ouagadougou are well below knowledge levels: Only five percent of the respondents were using a modern method of contraception, with about half of these women using the pill. Christian women were almost twice as likely as Muslim women to be using a modern method (seven percent vs. four percent), and those with a secondary education or more were far more likely than other women to be doing so (21 percent vs. 2–3 percent).

Forty-one percent of the respondents, on the other hand, reported that they were practicing postpartum abstinence, and nearly 10 percent were relying on periodic abstinence. The survey data indicate that women practice postpartum abstinence for an average of 14 months. The investigators observe, though, that some respondents do not view postpartum abstinence as a method of family planning: Two out of five women who said they were practicing postpartum abstinence denied elsewhere in the interview that they had ever abstained from intercourse for several months or longer in order to avoid pregnancy. The researchers hypothesize instead that at least some respondents consider postpartum abstinence to be simply a matter of custom.

Furthermore, focus group research conducted after the survey revealed that some Burkinabè women object to postpartum abstinence. They point out that while they practice abstinence, their husbands seek sex outside of marriage. Therefore, abstinence can be both costly (because a man is expected to buy presents for his girlfriend) and dangerous (because the husband may contract a sexually transmitted disease from his extramarital partners). The women also dislike being expected to raise the children produced by their husband's extramarital liaisons.

Most of the women said they might use a contraceptive method at some time in the future: Eighty-seven percent of former users of both modern and traditional methods and 89 percent of those who had never used a method of contraception said that they might do so.

Twenty-three percent of the 659 respondents who had had at least one child reported that they did not want to have any more. These women were aged 35, on average, and had had a mean of 6.5 children. Ten percent of them were using a modern method of contraception, while 65 percent were using a traditional method. The proportion wanting no more children rose from 10 percent of those with two living children to 30 percent of those with four, 53–56 percent of those with five or six and 77 percent of those with seven or more.

Another 47 percent of the women said

they wanted more children, but at some later time. These women were 26 years old, on average, and had had a mean of 3.3 children. Six percent of them were using a modern method, while 79 percent were using a traditional method. Overall, therefore, 70 percent of the married Burkinabè women surveyed wanted either to cease or to delay childbearing. Additionally, 19 percent were uncertain whether they wanted to have a child soon, or at all.

Data on the number of additional children the respondents wanted indicated that women with four or fewer living children generally wanted families of 4–5 children, a smaller number than is usually assumed to be desired in Africa: Those with no living children, for example, desired an average of 3.9 children; those with two living children wanted 2.3 more; and those with four living children wanted 0.8 additional children, on average.

The investigators observe that family planning information and services only became available in Ouagadougou in 1985, and that the program's newness may help to explain the finding that most survey respondents lacked detailed knowledge of modern contraceptives. Also, factors related to service delivery may have been at least partly responsible for low levels of current use. For example, the government maternal and child health centers that dispensed contraceptives were often short of trained staff and had to provide a range of health services besides family planning. Furthermore, until 1988, prospective users of hormonal methods had to obtain complex and expensive blood tests, which probably discouraged women from using these methods.

The researchers conclude that Burkinabè women have a "fairly widespread but vague knowledge of family planning, . . . a strong desire to space and limit births and positive attitudes toward future family planning use. Future contraceptive prevalence will depend on both the degree to which the observed motivation is transferred into action and the degree to which services become truly available and accessible to all those who want them."—*M. Klitsch*

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Tunisian Fertility Fell in the 1980s, Age at Marriage Increased and Infant and Child Mortality Declined

Forty percent of currently married women in Tunisia are using a modern method of contraception; this appears to be the highest level for any Arab or African country, according to the 1988 Tunisian Demographic Health Survey (DHS).[1] The total fertility rate in Tunisia decreased during the 1980s, from 4.9 to 4.3 lifetime births per woman for the periods 1982–1984 and 1985–1988, respectively. During the last three decades, the average age at first marriage has steadily risen among Tunisian women, from 19.4 years in 1956 to a current average of nearly 24. Largely because of improvements in sanitation and public health programs, the infant mortality rate has decreased from 200 deaths per 1,000 births in the 1950s to 50 per 1,000 at the time of the survey.

Marriage and Fertility

The Tunisian DHS is based on the results of interviews with 4,184 ever-married women aged 15–49. Almost all of the women interviewed were currently married at the time of the survey; only four percent were widowed, divorced or separated. Age at first marriage has been steadily rising in Tunisia, from an average of 19.4 in 1956 to 20.7 in 1966, 22.5 in 1975 and almost 24 in the late 1980s. The median age at first marriage has increased from 19.9 among women aged 45–49 to 22.8 among women aged 25–29. Among women aged 25–34, those in urban areas tend to marry about two years later than their rural counterparts, and women with at least some secondary education marry about three years later than do women with no education. (The legal age for marriage was raised from 15 years for women and 18 years for men in 1956 to 17 and 20 years, respectively, in 1964.)

Besides age at marriage, the DHS measured other factors that influence fertility, including breastfeeding, postpartum amenorrhea and abstinence, among mothers of 2,649 infants younger than 35 months. Nearly all Tunisian mothers breastfeed during the first two months after birth. The average duration is 15.5 months; 92 percent of women are still breastfeeding after three months and 76 percent after seven months postpartum. Women in urban areas breastfeed for shorter intervals than do rural women (12.7 vs. 18.2 months, on average), and those with secondary education breastfeed about half as long as do mothers with no education (9.8 vs. 18.2 months). For most women, menses return within one year of giving birth (7.2 months, on average). Forty-nine percent are amenorrheic for at least five months and 20 percent for 13 months, while postpartum abstinence is practiced for an average of 1.8 months. Based on these data, the DHS estimates that 34 percent of the women interviewed were still protected from pregnancy by amenorrhea or abstinence eight months after delivery.

Between 1982–1984 and 1985–1988, Tunisia's total fertility rate (TFR) dropped from 4.9 to 4.3. The TFR is lower among urban women than among rural women (3.4 vs. 5.7), and the decline in fertility since 1982 has been more pronounced among urban women than among rural women (17 percent vs. six percent). By region, the mainly rural, central-west part of the country has the highest fertility rate (6.0); in contrast, Tunis and the northeast area have the lowest rates (3.1 and 3.9, respectively). The mean number of children ever born to women aged 40–49 declined from 6.9 in 1980 to 5.8 in 1988.

Women's level of education is strongly linked to fertility rates and to the decline in fertility since 1982. Women with no education have a TFR of 5.1, compared with 3.9 among those with primary schooling and 2.5 among those with secondary or higher education. The decline in fertility between 1982 and 1988 among women in these three groups was six percent, 12 percent and 25 percent, respectively.

Contraceptive Knowledge and Practice

During the mid-1960s, Tunisia developed a strong family planning program to complement government efforts to improve maternal and child health. According to the DHS, there are 1,137 public centers offering contraceptive services, 75 percent of which use mobile units to reach more remote areas. The government's information program appears to be reaching most of the people: Sixty-four percent of all ever-married women said they had heard about family planning on the radio, on television or in meetings.

Knowledge of contraceptive methods is widespread among Tunisian women: Ninety-nine percent of ever-married women know of at least one modern method, 96 percent know about the pill and female sterilization, 95 percent know about the IUD and 87 percent know of

DIGEST

abortion. Lesser known modern methods include condoms (66 percent), vaginal methods (61 percent), injectables (59 percent), male sterilization (17 percent) and implants (16 percent). Ninety-one percent of women know of at least one traditional method; about half know of periodic abstinence and half know about withdrawal.

Knowledge of these methods is about the same for currently married women as it is for ever-married women, and the high levels of knowledge persist even when women are categorized by age, region and level of education. Knowledge of sources of the methods is only slightly lower than knowledge of the methods themselves.

When asked about potential problems of all methods, women were most likely to mention health risks associated with the pill (52 percent), the IUD (38 percent), female sterilization (19 percent) and injectables (15 percent). However, women considered modern methods (except vaginal methods) to be very reliable; the pill and implants were the reversible methods rated effective by the most women. Periodic abstinence was the method most frequently cited as ineffective and difficult to use (by 18 percent and six percent, respectively), and condoms and withdrawal were considered the least agreeable methods (by 29 percent and 26 percent, respectively). In Tunisia, which is a Muslim country, fewer than one percent of women cited religious reasons as a problem in using any method except female sterilization (seven percent) and male sterilization (five percent).

Ever-use of contraception among ever-married women shows an increase of 12 percent from the 1983 Contraceptive Prevalence Survey until the 1988 DHS. In 1988, 67 percent of ever-married women had used a method at some time and 61 percent had ever used a modern method, compared with 60 and 56 percent, respectively, in 1983. The greatest increase in use is shown for the IUD and the pill (25 percent and 21 percent, respectively), and these are the two most common methods (ever used by 36 percent and 34 percent of women, respectively), followed by periodic abstinence (16 percent), withdrawal (15 percent), vaginal methods or female sterilization (11 percent) and the condom (nine percent). Injectables and implants have been used by only 2.5 percent and 0.2 percent, respectively.

The Tunisian DHS also assessed knowledge and use of abortion, which has been legal (during the first trimester) since 1973. Knowledge of abortion was widespread: Eighty seven percent of ever-married women knew about it and 80 percent knew where abortions were provided. Although very few women thought that an abortion would be difficult to obtain (0.1 percent), 31 percent mentioned health risks associated with the procedure and 20 percent thought religion would be an obstacle to having an abortion. Thirteen percent of ever-married women had had an abortion at some time.

Most Tunisian women want at least three children, and very few (less than four percent) use a method of contraception before the birth of their first child. However, the proportion of women who use a method when they have no children or just one child has increased, from six percent among those aged 45–49 to 38 percent among those aged 20–24.

Fifty percent of currently married women aged 15–49 are using a method of birth control, and 40 percent are using a modern method. The three most common methods are the IUD, female sterilization and the pill (used by 17 percent, 12 percent and nine percent, respectively). The proportion of women using these three methods—37 percent—is higher than for any other Arab or African country for which data are available (from the DHS, World Fertility Surveys or Contraceptive Prevalence Surveys). The median age at sterilization is 33 years in Tunisia; 58 percent of the women have the operation before they reach 35. The most common traditional method is periodic abstinence, practiced by six percent of women.

When use of only modern methods is examined, contraceptive practice is found to increase with age and number of children; it is higher among women living in urban areas and among those with more education. Women aged 40–44 are five times more likely to use a method than are those aged 15–19 (50 percent vs. 10 percent). Women with four or more children are nearly twice as likely to use these methods as are those with one or no children (48 percent vs. 27 percent). A similar variation is seen between use among women living in Tunis compared with those living in the rural, central-west region (52 percent vs. 27 percent). Finally, among women with no schooling, 37 percent were using a method, compared with 45 percent of those with secondary or higher education.

Even though the prevalence of contraceptive use is high among currently married Tunisian women (50 percent), there are indications of unmet need for family planning. Among currently married women not using a method, 45 percent (20 percent of all married women) say they intend to use contraceptives in the future; 45 percent do not intend to use a method and 10 percent are uncertain. However, 39 percent of all married women are considered potential users of contraceptives, since they were not using a method and either said they wanted to space their next birth (17 percent) or did not want any more children (21 percent). Among all married women, nearly 60 percent say they do not want any more children and more than one in five would like to delay their next birth for at least two years. The number of children desired by Tunisian women has dropped from 4.1 in 1978 to 3.5 in 1988.

Maternal and Child Health

The Tunisian DHS found that of the 4,435 births occurring during the five years before the survey, mothers received prenatal care in 58 percent of cases, and more than half of this care was provided by midwives. In addition, mothers of just 33 percent of infants born during that time had received a tetanus vaccine. Sixty-nine percent of births were assisted by a medically trained person; midwives were the most-common birth attendant, assisting 53 percent of all births.

Infant mortality in Tunisia has decreased steadily, from 200 deaths per 1,000 births in the 1950s to 90 per 1,000 in 1980, 64 per 1,000 during the period 1978–1982 and 50 per 1,000 during 1983–1988. The decline is largely attributed to improvements in sanitation and to other public health efforts. Of the 4,211 children under five included in the survey, 70 percent had vaccination cards. Among those aged 2–5 who had cards, vaccine coverage was above 90 percent for tuberculosis, diphtheria-tetanus, polio and measles; 87 percent had received all recommended doses of every vaccine. Diarrhea remains the most common pediatric illness in Tunisia; 23 percent of infants aged 6–11 months had had an episode of diarrhea within 24 hours of the survey. Fifty-seven percent of mothers questioned knew about oral rehydration therapy; these women were more likely to be educated, urban and from the central-eastern part of the country.—*M. Witwer*

Reference

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Children Under Age Five Account for Half of All Deaths in Bolivia, with Diarrhea the Main Cause

In Bolivia, nearly one-half of all deaths occur among children under age five, a proportion more closely resembling that of Africa than that of Latin America. In 1986, the infant mortality rate in Bolivia was estimated to be 102 deaths per 1,000 infants under one year of age; the child mortality rate was 147 per 1,000 children under five. Furthermore, child mortality levels are a full two-thirds higher in rural areas than in urban areas. Diarrhea, usually associated with malnutrition, is the leading cause of child morbidity and mortality in Bolivia. These are some of the main points of a report examining the determinants of child survival in Bolivia that was published by the Bolivian National Population Council (Consejo Nacional de Población, or CONAPO) and the Research Triangle Institute.[1]

Mortality among children younger than five years old accounted for 49 percent of Bolivia's total mortality in 1986. This proportion approaches that of Africa in 1985 (53 percent) and is considerably higher than that of Latin America as a whole (34 percent). The corresponding proportion among the developed countries is three percent.

In 1986, the infant mortality rate in Bolivia was 102 per 1,000, while the child mortality rate was 147 per 1,000. These overall rates mask pronounced urban-rural differentials. For example, in 1986 the infant mortality rate was 83 per 1,000 in urban areas and 120 per 1,000 in rural areas; rates of child mortality in urban and rural areas were 110 per 1,000 and 184 per 1,000, respectively.

Infant and child mortality closely reflect conditions of nutrition, hygiene, maternal reproductive health and access to health care. Data from the Encuesta Nacional de Demografía y Salud (ENDSA), conducted in 1989 as part of the Demographic and Health Surveys project, indicate that morbidity and mortality levels peak around the time of weaning, when toddlers are deprived of the immunological benefits of breast milk just as they come into contact with unsanitary environments. For example, the proportion of infants who had diarrhea in the two weeks before the survey peaked at roughly 40 percent among babies aged 6–11 months and those 12–23 months, a proportion much higher than among either those aged 0–5 months (24 percent) or those aged 24–35 months (29 percent). Diarrheal infections are the most common cause of child morbidity and mortality in Bolivia; on an annual basis, the average Bolivian child spends one month suffering from diarrhea and another two recovering from it. Oral rehydration therapy reduces diarrheal mortality substantially, but among children who had diarrhea in the last two weeks before the survey, only one-fifth of babies aged 6–11 months and slightly over one-third of those aged 12–23 months had received treatment.

Toddlers who have been recently weaned are also at increased risk for respiratory diseases, the second most common childhood illness in Bolivia. Environmental and nutritional vulnerability to these ailments is aggravated by the lack of adequate medical care: According to the 1989 ENDSA, less than one-third of all children under five who were suffering from coughs had access to medical care.

According to the authors of the report, the 15 national immunization campaigns conducted to date have succeeded in lowering the incidence of polio, measles and whooping cough in Bolivia, but very large urban-rural differentials in coverage persist. As of 1987, roughly three-quarters of Bolivian two-year-olds had been vaccinated against measles and two-thirds had been immunized against tuberculosis, but only about one-half had received the complete series of polio and diphtheria-pertussis-tetanus shots (DPT), which are given in three doses. The authors note several likely explanations for the reduced coverage of polio and DPT immunization: Parents often do not understand that three doses are needed; the child may die before receiving all three shots; vaccination posts may be inaccessible; and the program tends to be inefficient, as demonstrated in a lack of supplies and follow-up.

Because of high levels of omission and distortion, national mortality data based on vital registration are extremely unreliable. Bolivia's National Statistics Institute has estimated that the proportion of deaths that went unrecorded ranged from 61 percent to 77 percent for the period 1976–1982. In an attempt to gain a more accurate picture, from 1982 to 1984 the health ministry's Maternal and Child Health Division conducted a household-based survey in urban areas (divided into three groups according to size of the population), with support from physicians and hospitals. Households were visited biweekly over one year and all births, illnesses and deaths were followed and recorded.

Fully 87 percent of the deaths detected in the survey were preventable and technically treatable. The authors of the report stress the all-important contribution of malnutrition to child mortality: Even though malnutrition was rarely cited as the actual cause of death, the pathologies reported in the survey revealed a strong correlation between the fatality of the diseases (intestinal and respiratory) and the degree of malnutrition of the child. Sixty percent of the children included in the household survey were normally nourished; 30 percent showed signs of malnutrition; and 14 percent were severely malnourished. The rate of severe malnutrition was highest—17 percent—among those aged one year, the age at which many children have been recently weaned. Further, nearly one-quarter of the one-year-olds who lived in the smallest cities (6,000–19,000 inhabitants) were severely malnourished.

Malnutrition often begins to affect a child's health even before birth. Babies born to undernourished mothers are at increased risk of prematurity and low birth weight; the mothers are at increased risk of complications in pregnancy, delivery and the puerperium. In this context, the chances for child survival are improved by prolonged breastfeeding, since both the period of immunologic protection and the contraceptive effects of lactation are extended, resulting in better protection against disease and longer intervals between births. However, data from the 1989 ENDSA indicate that one-quarter of infants aged 10–11 months and over one-half of those aged 16–17 months are currently not being breastfed, leading the authors to warn that a further decline in breastfeeding duration could have damaging effects.

Short birth intervals, high parity and high-risk pregnancies (those among women at either extreme of the reproductive period) all significantly increase the infant mortality risk. According to the 1989 ENDSA, only 12 percent of Bolivian women of reproductive age who are in union are using a modern method of contraception. The authors argue that improved birth spacing—achieved through effective contraceptive practice—will be essential if the current high rates of infant mortality are to decline.

The authors conclude that the possibilities of survival among Bolivian children are determined to a large extent by "access

DIGEST

to basic sanitation, to adequate nutrition and to education for the parents." Bolivia's high mortality rates are closely related to poverty and to the sharp inequalities in the distribution of resources and access to health services. Despite the relative success of massive vaccination campaigns, their impact has been unevenly felt in rural areas, which are still vastly underserved. The authors affirm that the prevalence of breastfeeding is closely linked to an infant's risk of illness and mortality. They also assert that malnutrition, with its roots in poverty and links to intestinal and respiratory illnesses, is the underlying cause of infant and child mortality in Bolivia.—*L. Remez*

Reference

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Many Births in Egypt Are Unwanted, Despite Wide Use of Modern Methods

Contraceptive knowledge among currently married Egyptian women is almost universal, and the contraceptive use rate is 38 percent, with almost complete reliance on modern methods, according to the 1988 Egypt Demographic and Health Survey (EDHS) for which 8,911 ever-married women 15–49 were interviewed.[1] The survey also found that couples tend to initiate childbearing soon after marriage, and women have an average of 4–5 lifetime births. However, 22 percent of the births in the five years before the survey were unwanted, and Egyptian women's level of current fertility is substantially greater than their ideal family size. Fertility rates are much higher in rural areas than in urban areas, as are rates of infant mortality.

According to the 1986 census, Egypt's total population is 48 million; this represents an increase of 10 million since the 1976 census. Twenty-one million people live in Lower Egypt (the area of the Nile delta), 17 million in Upper Egypt (the Nile Valley), and nine million in the urban governorates. Seventy-two percent of those living in Lower Egypt and 68 percent of those in Upper Egypt—most of the population—live in rural areas. Illiteracy is almost twice as high among females (62 percent) as it is among males (38 percent). Muslims make up 94 percent of the population; the remaining six percent is Christian.

Marriage and Fertility

Two-thirds of all Egyptian women aged 15–49 interviewed for the EDHS were currently married; 30 percent had never been married and the remaining five percent were widowed or divorced. Two percent or less of women 35 and older were never married. The number of divorced women peaked at under three percent in the 30–34 age-group. Sixty-six percent of all urban women 15–49 had been married, compared with 75 percent of all rural women.

One-fifth of Egyptian women were wed for the first time before the legal age of 16, but very early marriage is becoming less common: Thirty-five percent of women aged 45–49, but only 15 percent of those aged 20–24, married before age 16. Still, nearly half of all Egyptian women married before age 20, and two-thirds before age 25. Rural women marry considerably earlier than urban women: The median age at first marriage is 17 in rural areas and 20 in urban areas. Education has a strong effect on age at first marriage: The median age is 25 for women who have completed secondary school or higher, but only 17 for women with no education.

The total fertility rate (TFR) for the five-year period preceding the survey is 4.7 lifetime births per woman. For the 1986–1988 period the TFR is 4.4 births per woman, nearly 10 percent lower than the TFR for the 1983–1985 period (4.8 births per woman). Urban fertility is lower than rural fertility: Urban women can expect to have two fewer children than rural women (3.7 vs. 5.7), based on fertility over the five-year period prior to the survey. Likewise, the TFR is substantially lower (3.3 lifetime births per woman) in the urban governorates than in Lower Egypt (4.8 births per woman) or Upper Egypt (5.6 births per woman). The highest TFR in any region is found in rural Upper Egypt (6.4 births per woman). However, the rural TFR for the 1986–1988 period (5.4 births per woman) is 12 percent lower than that for the 1983–1985 period (6.1 births per woman), while the urban TFR declined by only seven percent between the same periods (from 3.8 to 3.5 births per woman); hence, fertility may be declining more rapidly in rural areas than in urban areas. Education has a strong influence on fertility levels: For the five-year period before the survey, the highest fertility (5.7 births) is found among women with no education; among women who have completed primary school, however, the TFR is 3.8 lifetime births per woman, and it is 3.2 among women with a secondary school education.

Roughly half of all current births are to women aged 20–29; the median age at first birth for women 25–49 is about two years higher (21) than the median age at first marriage for this group (19). About one in eight women aged 45–49 had their first birth before age 16, compared to one in 10 women 25–34 and one in 20 women aged 20–24. There is a difference of about three years between the median age at first birth for urban women (22 years) and rural women (19 years). Education has a strong effect on age at first birth: The median increases from age 19 for women with no education to age 25 for women who have had at least a secondary education.

Egyptian infants are breastfed an average of 17 months. More than two-thirds of those born one year before the survey were still being breastfed, as were 30 percent of those approaching age two but fewer than one in 10 of those older than 24 months. However, breastfeeding does not provide reliable contraconception for Egyptian women. For example, at 6–7 months postpartum, the proportion of women who were amenorrheic was only half the proportion who were breastfeeding, and at 14–15 months the proportion who were amenorrheic was only one-quarter the size of the proportion who were breasfeeding.

Contraceptive Knowledge and Use

Almost all ever-married Egyptian women (98 percent) know of at least one contraceptive method; modern methods are more widely known than traditional ones (98 percent vs. 67 percent). The pill is the most recognized modern method (97 percent), followed by the IUD (93 percent), injectables (61 percent) and female sterilization (54 percent). Prolonged breastfeeding is the most widely known traditional method, with the proportion recognizing this as a method of fertility control (65 percent) greater than for any modern method other than the pill and IUD. There are no significant differences in contraceptive knowledge according to age, residence, education or work status, with 95 percent of women in nearly all subgroups able to name both a modern method and a source of contraceptive methods.

Mass media and public information campaigns, particularly on television and radio, are conducted widely in Egypt as part of its family planning program; the EDHS assessed the impact of these messages. Television reached more women

than did radio; only 55 percent of currently married Egyptian women listen to the radio daily, compared with about 75 percent who watch television daily. Thirty-two percent of currently married women had heard a family planning message on the radio; 69 percent had seen one on television. Still, only 54 percent of rural women had seen a television broadcast about family planning in the month before the survey, compared with 84 percent of urban women; this may be partly because television is watched less in rural areas.

Fifty-seven percent of ever-married women have ever used a contraceptive method; while 56 percent have used a modern method, only 11 percent have used a traditional method. The highest level of ever-use is found among women 35–39 (70 percent) and the lowest among women 15–19 (12 percent). One-third of ever-users (20 percent of all ever-married women) initiate family planning use when they have one child, and one-quarter (13 percent of ever-married women) begin when they have two children; in contrast, only a very small number of Egyptian women begin using family planning before their first birth (one percent). However, among ever-users, the proportion who begin to practice family planning when they have one child increases from less than 14 percent among 45–49-year-olds to 44 percent among 25–29-year-olds.

Of currently married women, 38 percent are using a family planning method; almost all of these methods are modern. Fifteen percent use the pill and 16 percent use the IUD, while less than five percent use other modern methods and fewer than three percent use traditional methods. In urban areas, the contraceptive prevalence rate (52 percent) is more than double the prevalence rate in rural areas (25 percent). The IUD is the most commonly used method in urban areas (by 23 percent of currently married women); the pill is most often used in rural areas (by 12 percent). Method use peaks among the 35–39-year-olds, with 53 percent of currently married women in this age-group using a method. Data from the Egypt Fertility Survey (conducted in 1980) and the Egypt Contraceptive Prevalence Survey (conducted in 1984) show that contraceptive use has increased steadily since 1980 at a rate of about 25 percent every four years.

There is no strong preference for the pill or the IUD in any age-group. IUD use slightly exceeds pill use among 25–29-year-olds (18 percent vs. 15 percent), and there is some tendency for reliance on condoms and female sterilization to increase with age (although sterilization is not widely available or practiced in Egypt). The rate of current use increases sharply with parity: less than one percent among women with no children, compared with 23 percent among those with one child, 48 percent among women with three children and 44 percent among those with four or more children. Three out of every four current users obtain their contraceptive method from a private doctor or a pharmacy. Eighty-seven percent of pill users obtained oral contraceptives at a pharmacy; in contrast, 37 percent of IUD users obtained their method at a government facility, 43 percent from a private doctor and 17 percent at a pharmacy (for later insertion, most likely by a doctor).

Sixty percent of currently married women say they want no more children, 12 percent want more children later and 12 percent want more children soon. Ninety-five percent of currently married women without children say they definitely want a child, whereas just 15 percent of women with three children and five percent of women with five children definitely want another. Forty-nine percent of women from upper Egypt want no more children, compared with 65 percent or more from other areas and regions. Ten percent of women want no more children but say their husband wants more. In addition, five percent of the women surveyed want more children but report that their husbands do not. Forty-nine percent of currently married nonusers plan to practice contraception in the future, and around half of these women say they will begin to do so in the next year. Forty-two percent do not intend to use a method, and 10 percent are not sure if they will or not.

Even though the survey data indicate that at current rates, Egyptian women can expect to bear 4–5 children in their reproductive years, their ideal family size is smaller (2.9 children). Over one-third (36 percent) of ever-married women state a preference for a two-child family, and another one-quarter (26 percent) prefer a three-child family. Less than six percent of ever-married women express a desire for five or more children. The more children a woman has, the more children she is likely to prefer, and the more her current parity is likely to exceed her ideal family size: Ideal family size increases from 2.6 among women with one child to 3.4 among those with six or more children. More than one-third of ever-married Egyptian women state a preference for fewer children than they actually have. The largest mean ideal family size is found among women from rural Upper Egypt, who express a desire for 3.6 children; considering that their total fertility rate is 6.4 births per women, women in rural Upper Egypt are, on average, having nearly three children more than they would consider ideal.

Of women who had a birth in the 12 months before the EDHS, almost one-quarter report that the birth was not wanted; 16 percent say that it was wanted but at a later time. Ninety-seven percent of first and second births were wanted, although 14 percent of these births were considered mistimed. Of third or subsequent births, 37 percent were unwanted, and about 16 percent were mistimed. Using data from the five years before the survey, the authors of the survey report note that 22 percent of births in that time period were unwanted; they calculate a total "wanted" fertility rate of 3.6 births per women (compared with Egypt's actual average of 4.7 births per woman) and suggest that Egyptian women are currently having one child more than they actually want.

Forty-seven percent of currently married Egyptian women (58 percent of rural women and 36 percent of urban women) want to limit childbearing or space their next birth, but are not practicing contraception. Among currently married rural woman, 36 percent want no more children and are not using a method and 22 percent want to delay their next birth for two or more years but are not practicing contraception. Among women who want to limit or space births but are not using a contraceptive method, only about 40 percent plan to use one in the future.

Maternal and Infant Health

Egypt's infant and childhood mortality rates have decreased substantially since the 1970s. In the period 1974–1978, the infant mortality rate was 124 infant deaths per 1,000 births; by the 1984–1988 period, that rate was 73 deaths per 1,000. In 1974–1978, 203 of every 1,000 children died before reaching their fifth birthday, but by 1984–1988, this rate had dropped to 102 per 1,000. However, there are still substantial differences in infant and child mortality according to residence: In rural areas, the rate of under-five mortality is 164 deaths per 1,000 births, compared to 89 per 1,000 in urban areas. In addition, under-five mortality rates are highest among children born to mothers with no education (161 deaths per 1,000 births) and lowest among children of mothers with a secondary or higher education (49 deaths per 1,000 births).

Fifty-three percent of women aged

DIGEST

15–49 who gave birth in the five years before the survey received prenatal care, almost all of them from a doctor. However, only 42 percent of rural women received any prenatal care, compared with 69 percent of urban women. Of women with no education, 42 percent received prenatal care, compared with 81 percent of women with a secondary education or higher. Seventy-seven percent of all births took place in the mother's home or another home, while only 23 percent occurred in a hospital or clinic. Traditional birth attendants assisted at 58 percent of deliveries; doctors presided at only 28 percent.

Ninety percent of children under five were reported by their mothers to have had received at least some immunizations, but birth records for 60 percent of the children 12–23 months of age show the proportion fully immunized to be 54 percent among urban children and 20 percent among rural children. Diarrhea, one of the leading causes of infant and child death in Egypt, had affected 41 percent of Egyptian children in the 5–7 months before the survey, and 16 percent in the week before the survey. However, 97 percent of mothers knew about oral rehydration therapy, and 29 percent had treated the most recent episode with oral rehydration salts. Thirty-one percent of Egyptian children aged 3–36 months (35 percent of rural children and 26 percent of urban children) can be considered moderately to severely stunted, suffering a slowing of skeletal growth resulting from chronic malnourishment.— *R. Turner*

Reference

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Women in Singapore Find New Hormonal Implants Preferable to Injectables

Women who use the contraceptive implant rate their method higher than do women using injectable hormonal contraceptives, according to a study conducted in Singapore, and are substantially more likely than users of injectables to say they would use their method again.[1] In addition, women relying on implants are far less interested in switching to injectables than those using injectables are in switching to implants, and 41 percent of the women using the implant can think of no drawbacks to their method, compared with 16 percent of the women using injectables.

Between January and December 1988, researchers interviewed a group of 200 women 20–45 years of age who had visited the family planning clinic at Singapore's National University Hospital—75 current users and 25 former users of the NORPLANT® hormonal implant and 75 current users and 25 former users of injectables. All were married, had had at least one child and had used their method for at least one year. All were asked open-ended questions on implants and injectables.

Overall, the users of injectables and implants were of comparable age (31–32, on average) and parity (about two lifetime births). However, users of injectables were more likely to be under 30 years old (51 percent) than were users of implants (29 percent), and to have had only one child (31 percent vs. 15 percent). In addition, users of injectables were twice as likely as implant users to report wanting more children (38 percent vs. 18 percent). There were no significant differences in the two groups' ethnic composition.

Forty-one percent of the implant users said the most important reason for their using the implant was that it lasts for several years, while 35 percent mentioned this as the second most important reason. Twenty-nine percent cited the method's effectiveness as their most important reason for use, and 28 percent gave this reason as second most important. Furthermore, 27 percent cited as the implant's most important advantage their not having to remember to use it. In comparison, 92 percent of those relying on injectables thought the method's most important advantage was their not having to remember to use it, while 53 percent said its effectiveness was the method's second most important advantage.

Forty-eight percent of the implant users said that increased menstrual bleeding and spotting was the most important drawback of the method; 11 percent complained of other drawbacks, such as the absence of menses, the need for a surgical procedure for insertion and removal, a weight increase or headaches, but 41 percent mentioned no important drawbacks. Sixty-two percent of women who were using injectables said that increased menstrual bleeding or spotting was the most important disadvantage of the method, while another 14 percent mentioned the need to have another injection every three months; only 16 percent said there were no drawbacks to injectable use. Nearly all of the implant users said they had told friends and relatives about their experience with the implant.

Of the 75 current users of the implant, 69 percent said they planned to continue using the method after their current implants needed replacing, while only eight percent definitely did not expect to continue and 23 percent were uncertain. Among the women who were not planning to continue using the implants, more than 60 percent said they wanted to have another child, and most of the others gave as their reason that they were old and would reach menopause soon. No current implant users reported that they intended to use injectables soon; the vast majority attributed their decision to the fact that a new injection is required every three months.

On the other hand, only 31 percent of the 75 current users of injectables planned to continue using this method. Of those who expected to discontinue injectable use, 42 percent said they wanted to have a child, 35 percent said they were considering switching to implants and 23 percent were dissatisfied with the menstrual irregularities they experienced while using injectables. Overall, 60 percent of current users of injectables expected to use implants in the future, nearly all of them citing the convenience of implants' relatively longer duration.

Among the 50 former users of implants and injectables, nine in each group said they had discontinued use because of menstrual bleeding or spotting, and 14 former implant users and eight former users of injectables had stopped because they wanted to become pregnant. Eight women who had relied on injectables discontinued because their menses had ceased, whereas two former implant users attributed discontinuation to side effects such as breast nodules or dizziness. Nonetheless, former implant users were significantly more likely than former users of injectables to say they would return to using their method in the future (56 percent vs. 20 percent). In addition, 56 percent of the former users of injectables said they would consider using implants in the future, while no former implant users were interested in switching to injectables.— *M. Klitsch*

Reference

1. K. Singh, O. A. C. Viegas and S. S. Ratnam, "Attitudes Towards Contraceptive Implants and Injectables Among Present and Former Users in Singapore," *Journal of Biosocial Science*, 22:1, 1990.

Letters from Readers

Freedom of Choice

[James] Trussell and [Laurence] Grummer-Strawn, the authors of "Contraceptive Failure of the Ovulation Method of Periodic Abstinence" in the March issue of *International Family Planning Perspectives* [16:5, 1990], deduce correctly that failure to observe the ovulation method rules for pregnancy avoidance leads to unplanned pregnancy, a probability that is high with serious infraction of the rules. However, their conclusion that natural family planning is a way of life implies that "ordinary" people either can't or won't want to use it. This perception is heightened when the authors add that couples must be counseled about the serious risk of imperfect use.

Trussell and Grummer-Strawn confined their analysis to the World Health Organization (WHO) clinical trial of the ovulation method because the training factors are well documented. However, other natural family planning acceptor studies have analyzed ordinary users from many populations. Two of our papers showed effectiveness rates competitive with those of other family planning methods.* The discontinuation rates were one-third of discontinuations for reversible contraceptive methods in the index country. Neither education nor religion was a significant predictor of acceptance, but slightly older age (29) and previous contraceptive use (oral contraceptives) militated toward more consistent use of natural family planning. Perhaps it requires a certain amount of time and (sometimes, negative) experience with other contraceptive methods to establish a solid commitment to natural family planning.

It would be a mistake to deprive people of freedom of choice in family planning by emphasizing risk factors and thereby persuading providers not to offer natural family planning. The low number of imperfect use cycles and the high continuation rates associated with the ovulation method suggest that an emphasis on the benefits of natural family planning might be more appropriate.

Hanna Klaus, Executive Director
Natural Family Planning Center
of Washington, D.C., Inc.

On Computing Failure Rates

The article by Trussell and Grummer-Strawn appears to support the claims of ovulation method proponents that the method does a good job of ascertaining the fertile and infertile times of the menstrual cycle. Among participants in the WHO trial, abstinence during the fertile time resulted in a very low pregnancy rate; relations during the fertile time resulted in the expected pregnancy rate for any given cycle. According to the Couple to Couple League's chief medical adviser, Konald A. Prem, of the University of Minnesota, the probability that relations during the fertile time in any given cycle will result in pregnancy is about 30 percent; Trussell and Grummer-Strawn report a probability of 28 percent.

The authors emphasize that there is a high risk of unplanned pregnancy when couples have relations during stress cycles and hypothesize that "stress delays ovulation but not the estimated peak fecund day. . . ." In the field of natural family planning, this is commonly known as the double-peak syndrome. After an initial "peak day," the mucus appears to dry up for several days and then reappears. However, in the charted cycles in which I have observed this phenomenon, the second mucus patch is very short, generally lasting about three days. Thus, even if the woman detects the beginning of the second patch, sperm deposited the day before still would have a good chance of causing pregnancy. This possibility is one of the reasons why many couples prefer the cross-checking sympto-thermal method of natural family planning. In cycles in which ovulation may be delayed by stress, a couple can guard against misinterpretation of the mucus data by observing the woman's temperature pattern, which will not show a rise until after ovulation occurs.

The authors admit that their data show no relationship between coital frequency and unplanned pregnancy and yet stubbornly hold to their hypothesis that there must be such a correlation. A simpler explanation of the existing data is the very common postovulation "honeymoon" phenomenon of resuming relations after a period of abstinence.

Two things are particularly troubling about this article. First, it appears that natural methods of family planning are being singled out for a unique way of determining user-effectiveness rates, which is simply unfair. If the focus of attention is going to be on not following the rules during the fertile time, then the same standard must be applied in the same way to users of other methods. The results will be identical if users of barrier methods fail to use them during the fertile time. However, the authors' method of computing failure rates makes the pill and the IUD look better by comparison [with natural methods of family planning], and one has to wonder if that is not the overall intention.

Second, the authors, although they had access to primary data, failed to ask and to answer one of the big questions in the field of natural family planning: What is the unplanned pregnancy rate when

*H. Klaus, M. H. Labbok and D. Barker, "Characteristics of Ovulation Method Acceptors: A Cross-Cultural Assessment," *Studies in Family Planning*, **19**:299, 1988; and M. H. Labbok, H. Klaus and D. Barker, "Factors Related to Ovulation Method Efficacy in Three Programs: Bangladesh, Kenya and Korea," *Contraception*, 37:577, 1988.

couples follow the rules for the period before ovulation, but push them to the limit? That is, when couples consistently have relations on the last dry day, what is the probability of conception? A second and refined question: Does the unplanned pregnancy rate among those who have mucus patches of at least five days differ from the rate among those whose mucus patches are shorter?

John F. Kippley, President
Couple to Couple League

The Authors Reply:

We agree with Klaus's conclusion that "it would be a mistake to deprive people of freedom of choice." Unlike Klaus, we believe that for freedom to be authentic, it must be well informed. Informed choice requires that family planning practitioners provide accurate information on safety and efficacy about all methods, including the fact that the ovulation method has high efficacy when used perfectly but that imperfect use incurs a high risk of becoming pregnant.

Most people choose not to rely on periodic abstinence* because—contrary to Klaus's assertion—the failure rate among typical users is high compared with failure rates for other methods† and because it requires continual monitoring of physiological symptoms and lengthy abstinence from coitus (in the WHO trial, for about half of each menstrual cycle).‡ For these reasons, we agree with Josef Roetzer that "natural contraception regulation" is a way of life. This conclusion in no way implies that "ordinary" people cannot or will not use periodic abstinence.

We used data from the WHO clinical trial not because the "training factors are well documented," but because this trial is the only one that collected information on perfect or imperfect use during each cycle. Finally, we emphasize that a relatively small fraction of cycles of imperfect use does not indicate overall efficacy of periodic abstinence; in the WHO trial, imperfect use in only 11 percent of cycles resulted in one-fifth of all women becoming pregnant within one year of use.

In response to Kippley's letter, we maintain our hypothesis that coital frequency is a determinant of contraceptive failure. First, unless the risk per exposure of an event occurring is zero, it logically follows that the more times one is exposed, the greater is the probability that the event will occur. Kippley's honeymoon hypothesis could explain the observed lack of association between coital frequency and pregnancy if, and only if, the number of acts of intercourse that could result in pregnancy is constant across cycles, regardless of the total number of acts. While this possibility cannot be evaluated with the available data, we find it far less plausible than the hypothesis that acts of intercourse were underreported in the WHO trial. Second, the evidence for underreporting seems overwhelming. Conception rates per cycle day are much higher in the WHO trial than in other studies, and the WHO investigators themselves concluded that intercourse during the fertile phase was underreported.§

Contrary to Kippley's assertion, periodic abstinence is not being "singled out for a unique way of determining user-effectiveness rates." As we explicitly stated in our article, couples need information on efficacy during perfect and imperfect use in order to make truly informed choices about contraception. We presented the first correctly calculated probabilities of failure during perfect use (method failure) and failure during imperfect use (user failure) for any method of contraception. We chose to examine the ovulation method because the data from the WHO trial are the only available data on any method that can be used to make separate calculations of method and user failure. We would welcome analogous information for other methods.† Contrary to Kippley's assertion, rules for various methods do differ, and imperfect use of any given method can occur only when the specific rules governing its use are broken. For example, although the rules for the pill state that it must be taken every day, the rules for the condom state that it must be used at every act of intercourse. Thus, it would make no sense to claim that the condom is used imperfectly if it is not used every day. Likewise, it makes no sense to apply the ovulation method rules to other methods (for instance, by defining imperfect use of the condom as such only when it occurs during the fecund period). Barrier methods such as the condom will have lower failure rates during imperfect use precisely because imperfect use can occur at times other than during the fecund period. Indeed, it is very unlikely that most users of barrier contraceptives could even identify their fecund period with any degree of precision.

Finally, Kippley's statement that we had access to primary data is misleading. Not all of the detailed information from the subjects' menstrual charts was transferred to the machine-readable analysis file constructed by WHO. The charts themselves still reside in the basement of WHO headquarters and presumably would be made available to Kippley or any other, capable analyst. However, we doubt that detailed analysis of the menstrual charts would provide a clear answer to the question he raises, given the underreporting of intercourse already mentioned.

*The 1988 round of the National Survey of Family Growth revealed that only 2.1 percent of women aged 15-44 who were at risk of an unintended pregnancy relied on periodic abstinence; of these, three-quarters used the calendar variant alone. Source: Unpublished tabulations by Barbara Vaughan from the public-use tape.

†J. Trussell et al., "Contraceptive Failure in the United States: An Update," *Studies in Family Planning*, 21:51, 1990, Table 1.

‡C. Djerassi, "Fertility Awareness: Jet-Age Rhythm Method?" *Science*, 248:1061, 1990; and World Health Organization (WHO), "A Prospective Multicentre Trial of Natural Family Planning. III. Characteristics of the Menstrual Cycle and of the Fertile Phase," *Fertility and Sterility*, 40:773, 1983.

§WHO, "A Prospective Multicentre Trial of Natural Family Planning. III. Characteristics of the Menstrual Cycle and of the Fertile Phase," *Fertility and Sterility*, 40:773, 1983.

Note to Authors

International Family Planning Perspectives is a peer-reviewed quarterly journal publishing research articles about the developing world that are intended to be of assistance to professionals in the fields of fertility and family planning, maternal and child health and population policy. The editors invite researchers, policymakers and program operators from around the world to submit articles on such topics as contraceptive practice and research; population growth; fertility levels, trends and determinants; childspacing; public policies and legal issues affecting family planning and childbearing; family planning program operation, development and evaluation; information, education and communication activities; sexually transmitted diseases; and reproductive, maternal and child health. Manuscripts should be sent to the address below, and should include the complete affiliation, address, telephone number and Fax number of the author with whom we are to correspond.

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Manuscripts should be typed double-spaced, with all pages numbered and with a title page that includes the names and affiliations (at the time of the work reported) of all authors. Submissions should run no more than 30–35 pages, with no more than 7–8 tables; only one copy need be sent. Manuscripts should include a summary of up to one page in length.

Each table and chart should be on a separate page. Authors should check previous issues of *International Family Planning Perspectives* to gain an idea of how tables are to be styled. Authors must supply data points for all line graphs and charts; final art work will be done by the journal's staff.

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